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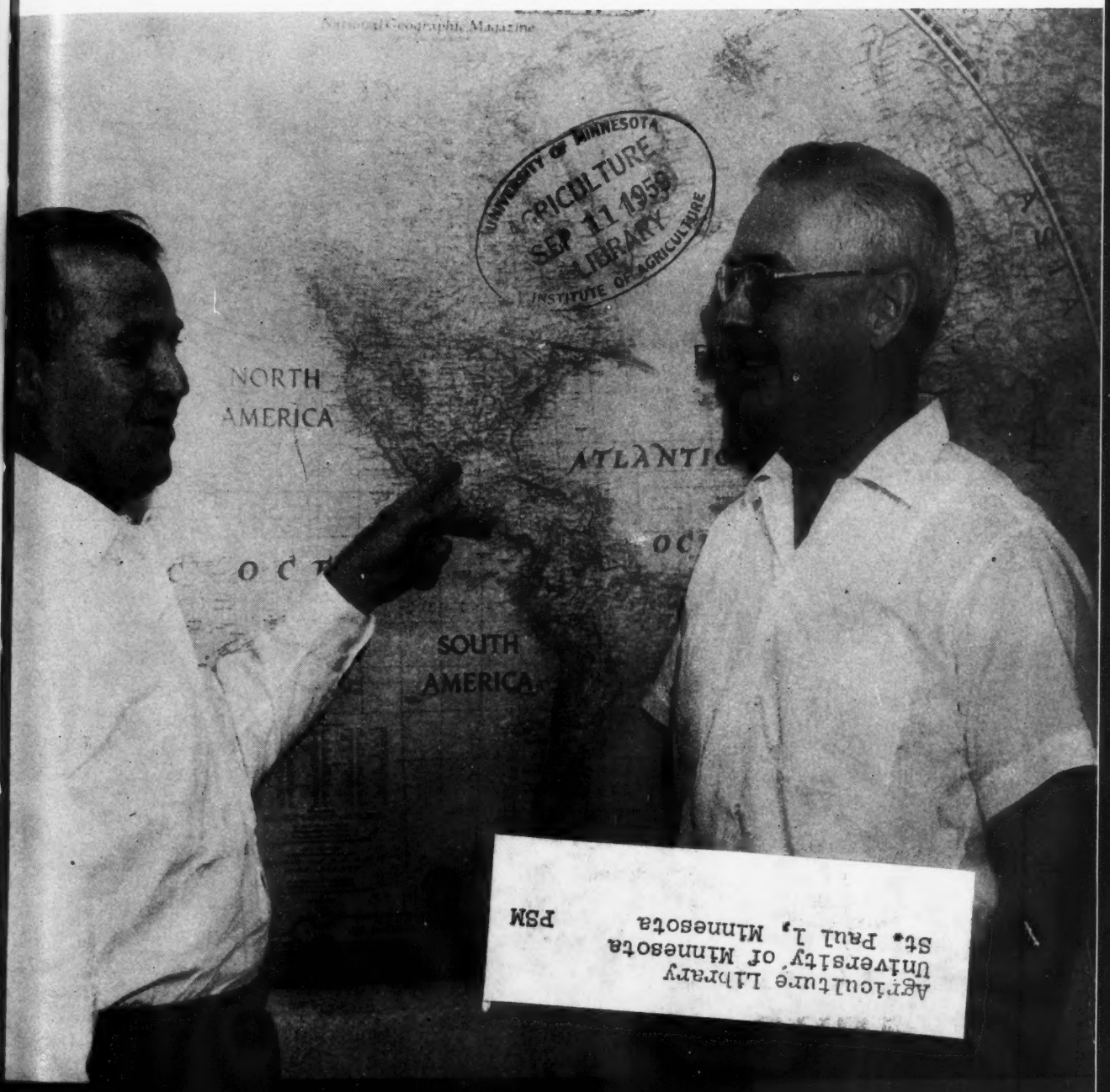
FARM CHEMICALS



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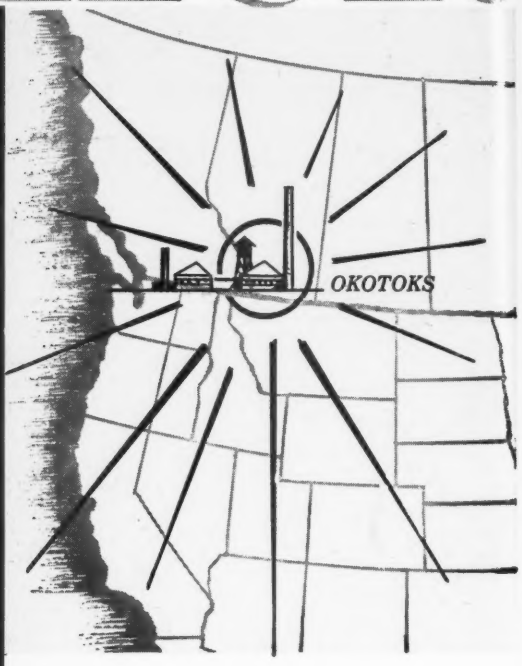
Special report on Hayes-Sammons pesticide marketing

SULPHUR

Spotlighting the new TGS Recovery Plant at OKOTOKS



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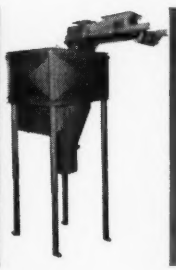

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BPA
MEMBER BUSINESS PUBLICATIONS AUDIT

The national business magazine for the fertilizer and pesticide industries, FARM CHEMICALS, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: $6.00; in other countries: $7.50. Single copy 50 cents. Established in 1894 as *The American Fertilizer*.

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FARM CHEMICALS

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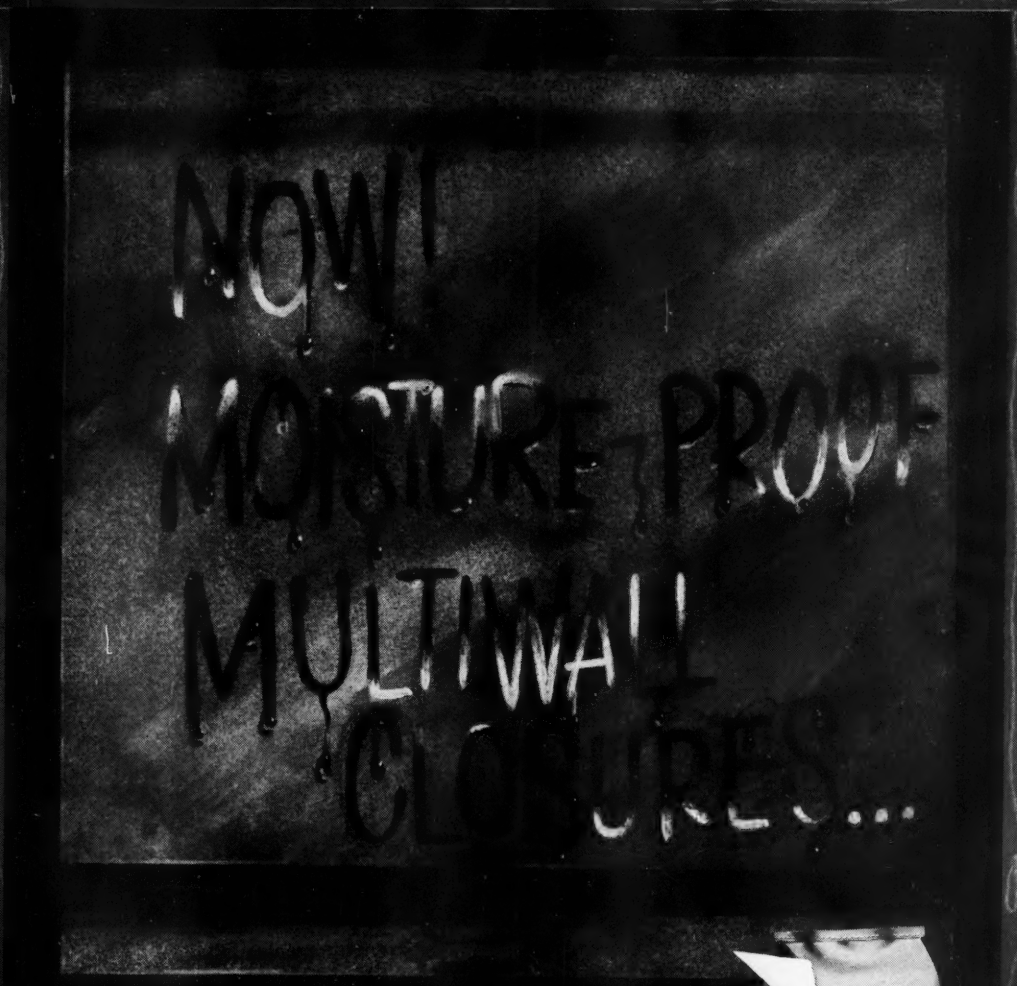
THE COVER PICTURE

Next time you become discouraged and wonder if your company will ever reach the goals you have set for it, think of how far Hayes-Sammons Chemical Co., Mission, Texas, has come in just a few years! On this month's cover are the two men who have guided the company on its breath-taking pace. Pointing to one of the major marketing areas of the large pesticide company is Claborne B. Brazeal, vice president, with Thomas B. Sammons, Jr., president, looking on. For the complete "Hayes-Sammons Story" please turn to page 16 of this issue.



for **BOTH ENDS** of the bag!

CHASETITE tape-over-sewn-closures
...provide a perfect TOP-AND-BOTTOM moisture barrier

WHAT IT IS . . . HOW IT WORKS

Using a special tape, adhesive, and method of application. CHASETITE closes a bag with the most positive seal known! Gives a perfect bond, even with dust particles on the tape. It is impossible to tear the CHASETITE closure off a bag without pulling part of the outer bag ply with it. Seals from tape end to tape end—firmly sealing the ends extending beyond the bag surface.

Applies at such speed that heat won't scorch paper or melt a poly-coated inner sheet! (No reduction in bag filling speed is required). Airborne moisture doesn't penetrate needle holes, ends risk of "pencil-line" hardening of material at the closure.

Contact your local Chase representative, or write today:

The stubborn problem of moisture penetration through bag closures has been licked once and for all. Now, you can specify Chase Multiwalls with CHASETITE heat-bonded tape-over-sewn *bottom* closure . . . and you can moisture-proof the *top* closure right in your own plant simply by installing the low-cost, money-saving CHASETITE unit. Your compact, new CHASETITE unit pays for itself by reducing adhesive waste, and assuring top protection against ruinous moisture pick-up. Installs on existing conveyors, needs only 2 feet board space. Prices and installation diagram on request.

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General Sales Offices: 155 East 44th Street
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Take those big preseason savings on LION® E-2 now!

It's the one and only ammonium nitrate you can safely store for big spring markup and extra profit! Lion E-2 is free-flowing when you get it...free-flowing when you sell it...no matter how long you store it!

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EASY-TO-HANDLE BAGS. Lion E-2 multiwall bags are specially coated with Monsanto Syton®—the antislip agent that lets you stack Lion E-2 higher ... move it faster ... handle it easier. It helps you save time, work and space ... reduces material losses through breakage due to slippage.

TAKES LESS STORAGE SPACE. Lion E-2 has the greatest density of any ammonium nitrate on the market. It's less bulky ... takes 20% to 25% less storage space. It saves you needed floor area. It isn't necessary to spread out E-2 in smaller stacks. With E-2 you stack higher utilizing all available storage area, without fear of caking. You can *safely* stack E-2 higher.

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NEW LION E-2

Always stores...

Always pours

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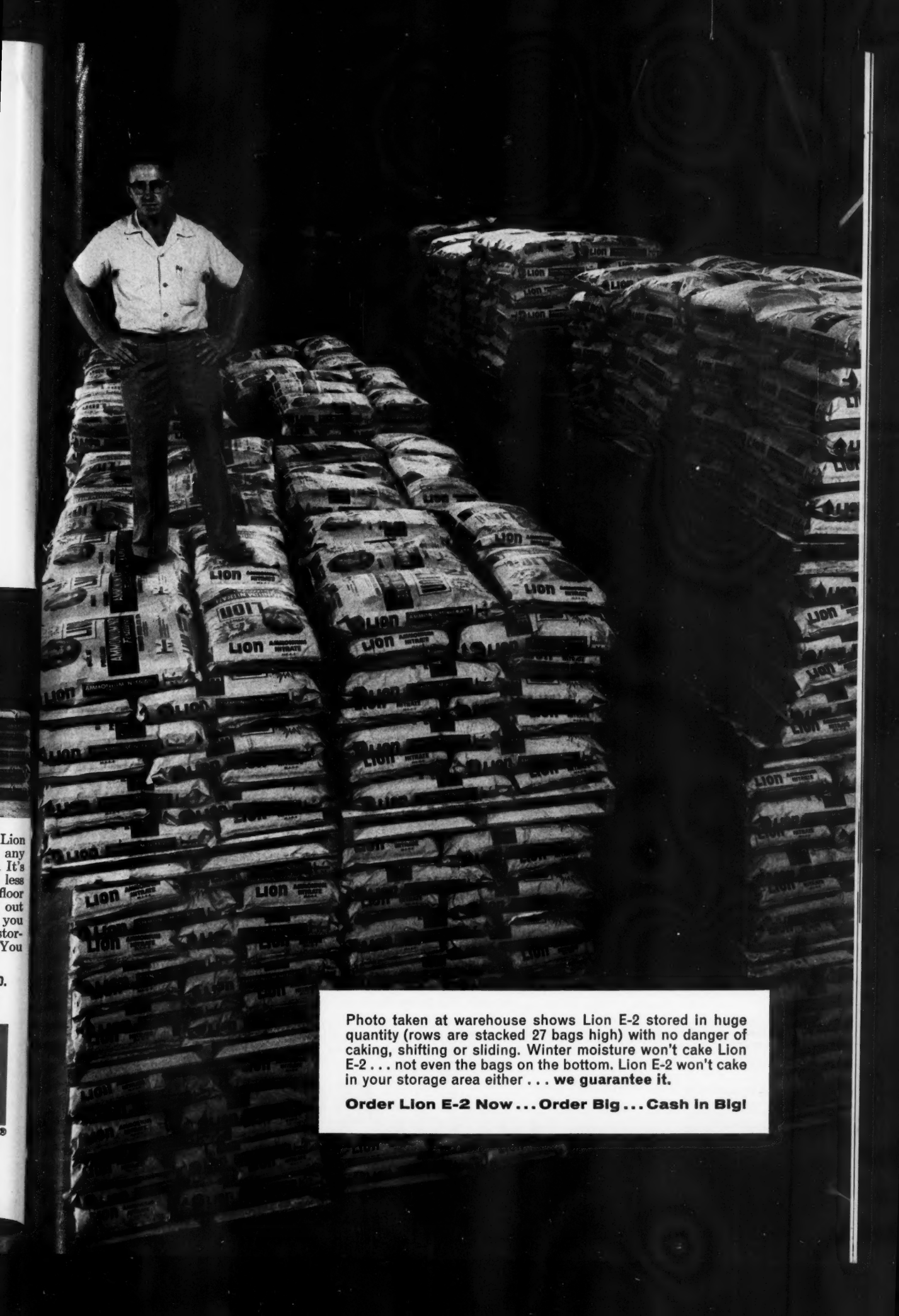
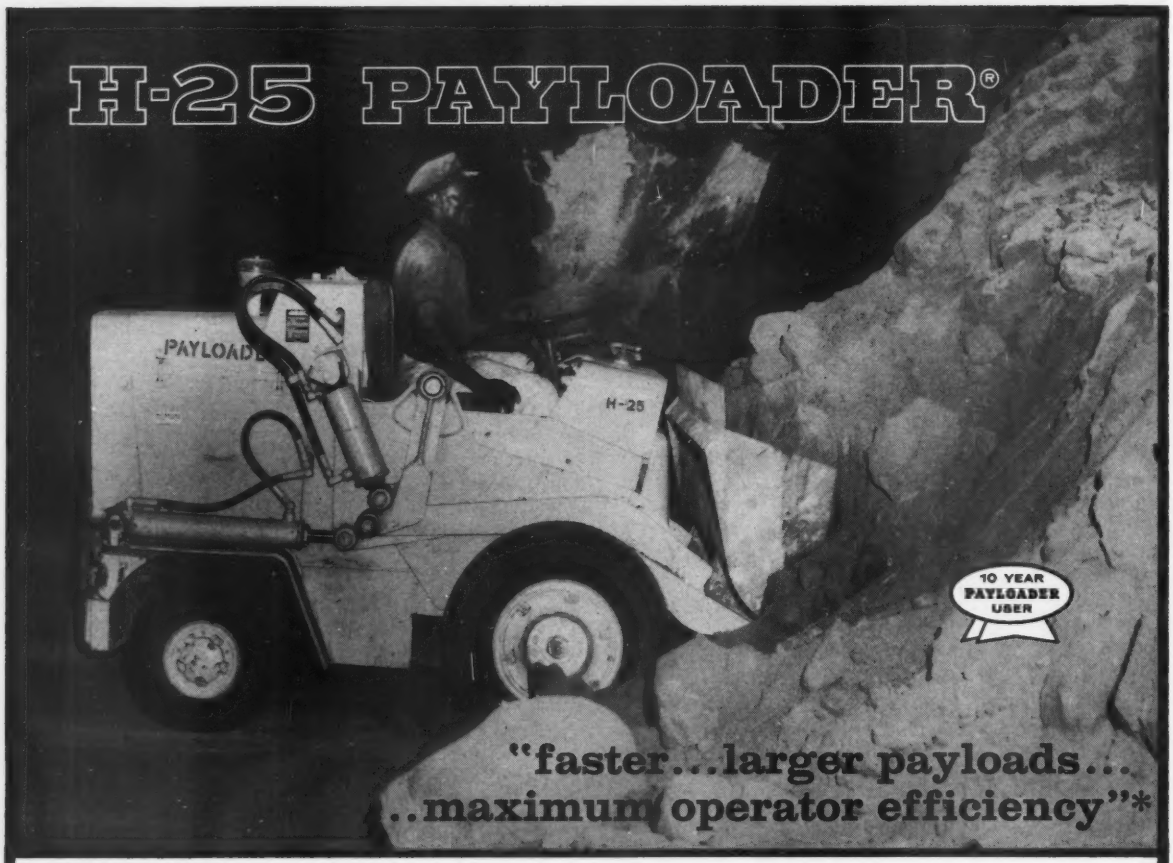


Photo taken at warehouse shows Lion E-2 stored in huge quantity (rows are stacked 27 bags high) with no danger of caking, shifting or sliding. Winter moisture won't cake Lion E-2 . . . not even the bags on the bottom. Lion E-2 won't cake in your storage area either . . . **we guarantee it.**

Order Lion E-2 Now . . . Order Big . . . Cash in Big!

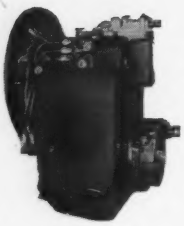
H-25 PAYLOADER®



**"faster...larger payloads...
..maximum operator efficiency"***

Exclusive..

Complete power-shift transmission



. . . the only tractor-shovel in its size range with full power-shift transmission having two speeds forward and two reverse . . . the low range for digging power and close maneuvering . . . the high range for fast, economical travel in either direction.

***"We have been using 'PAYLOADER' units for some 10 years with very satisfactory service. Our latest, the H-25, is doing an all-around better production job. It is faster, carries larger payloads and we get maximum operator efficiency because of less operator fatigue",** says J. E. Dorland, Mgr. McMillan & Harrison Fertilizer Co., Mobile, Ala.

BUILT-IN MANEUVERABILITY AND SPEED

The Model H-25 with 2500 lb. carry capacity, only 6 ft. turning radius, power-shift and easy power-steering is the most concentrated package of tractor-shovel ever designed. "No-spin" differential and 4500 lbs. of bucket breakout force are two other reasons for the outstanding traction and digging power of this superior tractor-shovel.

LOWER MAINTENANCE — LONGER LIFE

The boom and bucket mechanism is rugged and simple with fewer parts and linkages and with anti-friction bearings at critical pivot points. Triple air cleaning for the engine, cartridge-type filters on all three oil systems, self-adjusting sealed hydraulic brakes and special grease and oil seals at all pivots and ball joints all contribute to long life and low maintenance.

Ask your Hough Distributor to prove the H-25 on your work. Ask him, too, about larger models in the "PAYLOADER" line.

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THE FRANK G. HOUGH CO.
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LETTERS

I have read with considerable interest three articles published in your magazine "Farm Chemicals" over the last several months concerning fertilizer operations in the Pacific Northwest. These articles were written by Mr. Homer Hathaway. These articles cover operations of three independent fertilizer dealers in the State of Washington and naturally are some of our competition.

Inasmuch as in two of these articles they made certain references to our organization as the Co-Op., indicating the manner in which they were competing with the Co-Op. in various phases of selling, it seemed to me that in all fairness to your readers and to our organization that at least we should be entitled to a rebuttal in a similar article by Mr. Hathaway covering our operations.

I would appreciate a chance to talk with him concerning such an article.

BURL B. WYCKOFF
Manager Fert. & Farm. Chem. Dept.
WASHINGTON COOPERATIVE FARMERS ASSOC.

Richmond, Calif.

You and your fine magazine are to be congratulated on your series of articles on "How Is Your Marketing I.Q.?" Certainly the industry needs to raise itself by its own boot straps. We have a quality product, one which returns unusual dividends and yet, by and large, we do a miserable job selling what the product can do for our customers. To my way of thinking, we need to sell results, we need to program our materials to accent their positive properties and to avoid any possible pitfalls which might result if the products were used so as to magnify any weakness. When properly used, all products are superior to others simply because one takes advantage of the plus factors in the individual product.

MALCOLM H. McVICKAR
Chief Agronomist
CALIFORNIA SPRAY-CHEM. CORP.

Louisville, Ky.

We have gotten very good use out of your series of articles written about fertilizer marketing. We would like to obtain fifteen sets of these articles for distribution to our management. . .

Yours very truly,
JAMES M. MILLER
Advertising Manager
FEDERAL CHEMICAL CO.

Kingston, Ohio

We were indeed impressed by two articles appearing in the August 1959 (Vol. 122, No. 8) of FARM CHEMICALS. Please send 30 reprints each of: "18 Telephone Shortcuts to Sales" by Ted Pollock, and "Clean up your Communications" by F. E. Hartzler. . .

Sincerely,
NORMAN DEAN GODDEN
Sales Manager
FLO-LIZER, INC.

New York, N. Y.

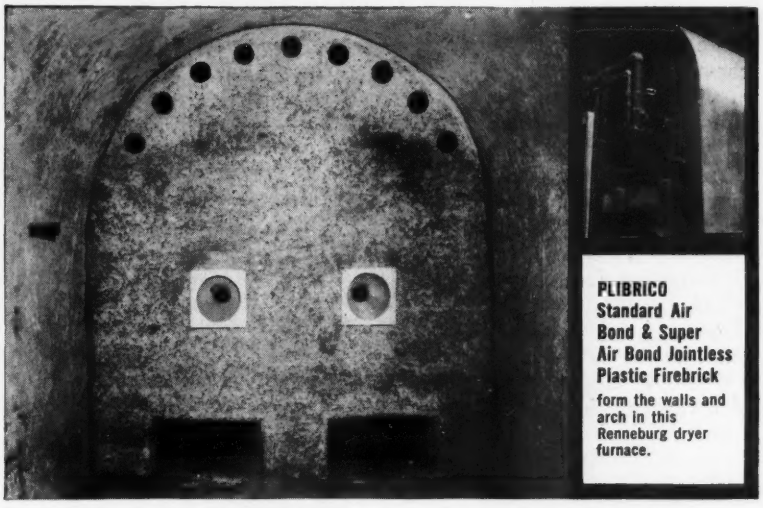
We have read with considerable interest in Vol. 122 No. 8, August 1959 issue of FARM CHEMICALS the excellent article on page 14, "How to Motivate Salesmen" by Erwin H. Klaus.

Would it be possible for us to secure 25 reprints of this article for distribution to our men? . . .

Sincerely yours,
JOHN A. RODDA, Manager
FAIRFIELD CHEMICALS
FOOD MACHINERY AND CHEMICAL CORP.
New York, N. Y.

I have read with great interest the three articles you have on merchandising fertilizer, appearing in the July issue of your magazine. These three articles, written by Ted Pollock, E. H. Klaus and F. E. Hartzler, are excellent and could not be more timely. It is gratifying to see an industrial magazine publish this sort of helpful information. Undoubtedly one of the major problems in the fertilizer world today is that of making a fair profit. Your editorial policy is certainly in step with the times. If possible, I would like 1,000 reprints of each of these three articles. Kindly send them direct to me, along with invoice.

WALTER S. COLVIN
Director, Agricultural Sales
NITROGEN DIVISION
ALLIED CHEM. CORP.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Standard Air Bond & Super Air Bond Jointless Plastic Firebrick
form the walls and arch in this Renneburg dryer furnace.

...at internationally known chemical plant

"Air Bath" lengthens life of dryer furnace

The nine air ports across the top of this furnace let tempering air enter and circulate beneath the arch. Heat build-up is reduced and the furnace lining lasts longer. Innovations of this kind are typical of Plibrico engineering . . . ideas born of years of specialized refractory/engineering experience.

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Single source guarantee . . . When you turn over full responsibility for top performance to Plibrico you can be sure of a properly integrated installation . . . years of engineering experience/the right materials for each furnace zone/careful supervision and installation.

Save money on your next installation, contact your local Plibrico Field Engineer . . . he can engineer refractory linings for any heat enclosure. WRITE FOR CATALOG 73 packed with cost-saving histories.

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REFRACTORY PRODUCTS · ENGINEERING · CONSTRUCTION

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WHAT'S DOING IN THE INDUSTRY

F
C

CANADIAN FERTILIZER ASSN. CONVENED IN AUGUST

Representatives from major fertilizer companies in eastern Canada, many western delegates and representatives of primary suppliers in both the United States and Canada attended the annual convention of Canadian Fertilizer Association, at the Bigwin Inn, Ontario, August 18–22.

Dr. A. C. Richer, professor of Soil Technology at Pennsylvania State University, addressed the convention on "Facts and Fallacies in Organic Farming;" Francis A. Raymaley, grassland specialist with American Cyanamid Co., spoke on grassland farming; and C. H. Goulden, assistant deputy minister of agriculture, Canadian Dept. of Agriculture, had as his topic, "An Organization for Agricultural Research in Canada. Dr. David Hopper of the Agricultural Economics Dept., Ontario Agricultural College, discussed the economics of agriculture in his talk entitled "Whither Agriculture."

TENN. FERTILIZER SALES INCREASE 17 PER CENT

Tennessee fertilizer sales in 1958-59 show an increase of more than 17 per cent over the preceding year. For the fertilizer year ending June 30, 1959, the total tonnage of fertilizer sold in Tennessee exceeded 572,000 tons, according to Dr. W. D. Bishop, Extension Agronomist, University of Tennessee. This compares with 489,000 tons for 1957–58.

TOTMAN RESIGNS AS V.P.

James C. Totman, vice president of Summers Fertilizer Co. of Baltimore, Md., and Northern Chemical Industries of Searsport, Me., has resigned from both companies as of July 31, 1959. He and his family expect to shortly establish themselves in Geneva, Switzerland.

NPFI SPONSORS WORKSHOPS

Iowa has been chosen as the site for one of two fertilizer promotion workshops that will be sponsored by the National Plant Food Institute during 1959–60. Location of the other workshop has not yet been finally determined, but an announcement is expected in the near future.

The Iowa workshop is scheduled for December 10, and probably will be held either at Waterloo or Des Moines. It will be open to salesmen and other personnel of NPFI member companies only and any dealers that they may wish to invite, the association reported.

CYANAMID ANNOUNCES APPOINTMENTS

Frank H. Cappy, advertising manager for American Cyanamid Co.'s Agricultural Div., has been assigned additional responsibilities for public relations and packaging development, it was announced Aug. 17 by B. F. Bowman, divisional general manager.

Bowman also announced the appointment of promotion managers for each of the division's three basic product categories: R. G. Tousey, phosphates and nitrogen department; E. B. Shaw, pesticides; S. B. Bromley, animal industry products. Dr. L. W. Groves has been named assistant promotion manager for animal industry products.

A.N. NOT EXPLOSIVE

According to authorities of the Manufacturing Chemists' Association and the National Plant Food Institute, representatives of manufacturers of ammonium nitrate, extensive tests over a period of a year have definitely proved that fertilizer grade of ammonium nitrate is not an explosive. It will not explode unless mixed with some organic matter such as oil.

A blasting agent is made by mixing ammonium nitrate with diesel fuel. It is believed probable that the truck which exploded at Roseburg, Oregon, contained dynamite plus this blasting agent. (See special report, page 39).

MILLER PRODUCTS BUYS FORMER AUTO PLANT

Miller Products Co. has announced purchase of the former Kaiser-Frazer automobile assembly plant in Portland as part of a major expansion program. More than $500,000 will be invested in the new location, Miller reports, which will treble its manufacturing space.

The company's move from its present location and remodeling of the building is expected to be completed by the first of the year. A formulation building also will be constructed.

Meeting Highlights

American Chemical Society National Meeting
Div. of Fertilizer and Soil Chemistry

Haddon Hall Hotel, Atlantic City, N. J.

Recent advances in fertilizer technology and soil testing will be discussed at the ACS meeting, which opens Sept. 13.

Thirty-three technical reports by authorities in the fertilizer field have been scheduled, beginning Sept. 14, and continuing through Sept. 17. There will be a symposium on soil testing on Sept. 15.

On the 15th, Bruce D. Cloaninger, secretary-treasurer of the Association of American Fertilizer Control Officials, will present a luncheon address titled "The Consistency of Change."

National Agricultural Chemicals Assn.

French Lick-Sherton Hotel, French Lick, Ind.

Oct. 21-23. "Sales and Marketing of Pesticides," by Robert S. Thompson, president, Thompson-Hayward Chemical Co.; "Advertising and Promotion," by Lou F. Czufin, advertising manager, California Spray-Chemical Corp.; panel discussion on "Wildlife & Pesticides."

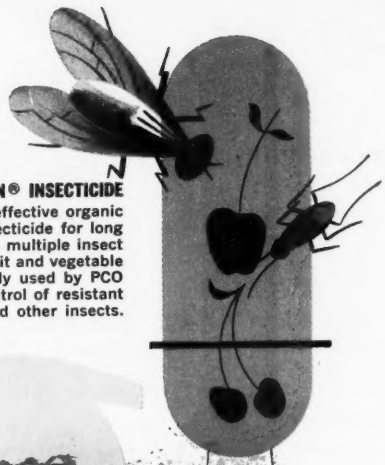
Featured speaker at noon luncheon, Oct. 21, will be Senator Everett F. Dirksen, Illinois, Senate Minority Leader.

NAC staff report: "NAC Works For the Industry." "World Pest Control Developments," by Dr. H. L. Haller, asst. to adm., Agricultural Research Service, USDA. Discussion by Joe Noone, NAC, and Justus C. Ward, chief, Registration Sec. Pesticide Regulation Br. Plant Pest Control Div., (USDA) "How H. R. 6436 Affects the Industry."

get more sales—more satisfaction

WHEN YOU SELL OR USE

geigy agricultural chemicals



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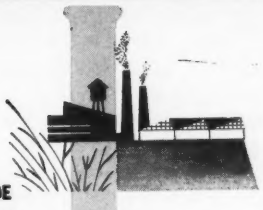
Versatile effective organic phosphate insecticide for long residual fly control, multiple insect control on many fruit and vegetable crops. Extensively used by PCO industry for control of resistant roaches and other insects.

Geigy
METHOXYCHLOR INSECTICIDE
Multi-purpose insecticide. Long residual action against many insect species attacking fruit, vegetable, forage crops, and stored grain. Controls horn flies, cattle lice and ticks on livestock.



ATRAZINE HERBICIDE
Highly effective, new herbicide for pre-emergence use on corn, which also shows outstanding promise as a post-emergence herbicide. One application provides season-long weed control. Also effective as an industrial pre- or post-emergence herbicide at higher rates of application. Outstanding for many safety features.

SIMAZINE HERBICIDE
Pre-emergence herbicide for use on corn. One application gives season-long effective weed control. Also for weed control in nursery stock, and at higher rates of application, as an industrial herbicide. Outstanding for many safety features.

SEQUESTRENE® METAL CHELATES
Original metal chelates in agriculture. For correction of minor element deficiencies of ornamentals, fruit trees, vegetables, turf. Compatible with most commonly used insecticides, fungicides, fertilizers.

CHLOROBENZILATE® MITICIDE
Safe, effective miticide for use on deciduous and citrus fruit, ornamentals and nursery stock. Long residual action.

New formulations

SIMAZINE 4G (4% granules)

SEQUESTRENE NaFe Iron Chelate on Vermiculite

DIAZINON 2½G (2½% granules)

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WASHINGTON VIEWPOINT

F
C

There's no question in some scientific circles that existing fallout is the Number 1 food contamination agent and that it should be treated as such.

Here is a summary of results of the sample survey conducted in 19 states by FDA.

The dangers of radioactive fallout show signs of over-shadowing in the public mind the alleged threat of pesticide residues in food to human—and wildlife—well being. At least the federal government apparently is feeling increased pressures to take the effects of existing fallout residues much more seriously than it seems to have done in the past. There's no question in some scientific circles that existing fallout is the Number 1 food contamination agent—and that the government should treat it as such.

To date, there has been noticeably scant federal effort to find out precisely how widespread food and food material contamination is—and the level of radioactive elements which wind up in the food supply—and exactly what danger this presents to present and future generations. Even though isolated tests in the past indicated a danger exists, it was not until recent official disclosures that the government showed much inclination, publicly at least, to move strongly into this field.

Following these disclosures—described below—the government now is preparing a broadscale attack on the program. This is expected to develop in the form of a crash research program supported by a manifold increase in federal emergency funds, and in a master plan to coordinate this country's entire atomic energy and related programs under central leadership.

Official test results, which seem to have touched off the government's new activities in the field, showed that hay and ensilage fed to cattle are the "hottest" food or food raw materials in terms of radioactive contamination of all food materials tested to date. While the over-all radioactivity tests were conducted in only 19 states through only 121 samples, the impression officials give is that most if not all States in the Union are thus contaminated.

The findings seem to have been developed almost by pure accident. At the time the tests were made—June, 1958 through January, 1959—the Food & Drug Administration was running tests to determine the amount of pesticide residues in food materials. Someone suggested it might be a good idea to run a test for radioactivity simultaneously—thus "killing two birds with one stone very economically." So the highly significant fallout test was run as a subordinate part of the previously planned pesticide survey—or at least that's the impression newsmen get from recent announcements.

Here, in summary, are the results of the sample survey conducted last summer and fall by the FDA:

Samples from 19 states (*none other was tested*) showed that hay in each state contained radiation elements—some of which disappear relatively quickly and are said to be of less long-range concern. Of the 121 taken, however, 4 were tested for strontium 90, which lasts for years and which "has an affinity for bones when ingested by human beings," causing bone cancer eventually.

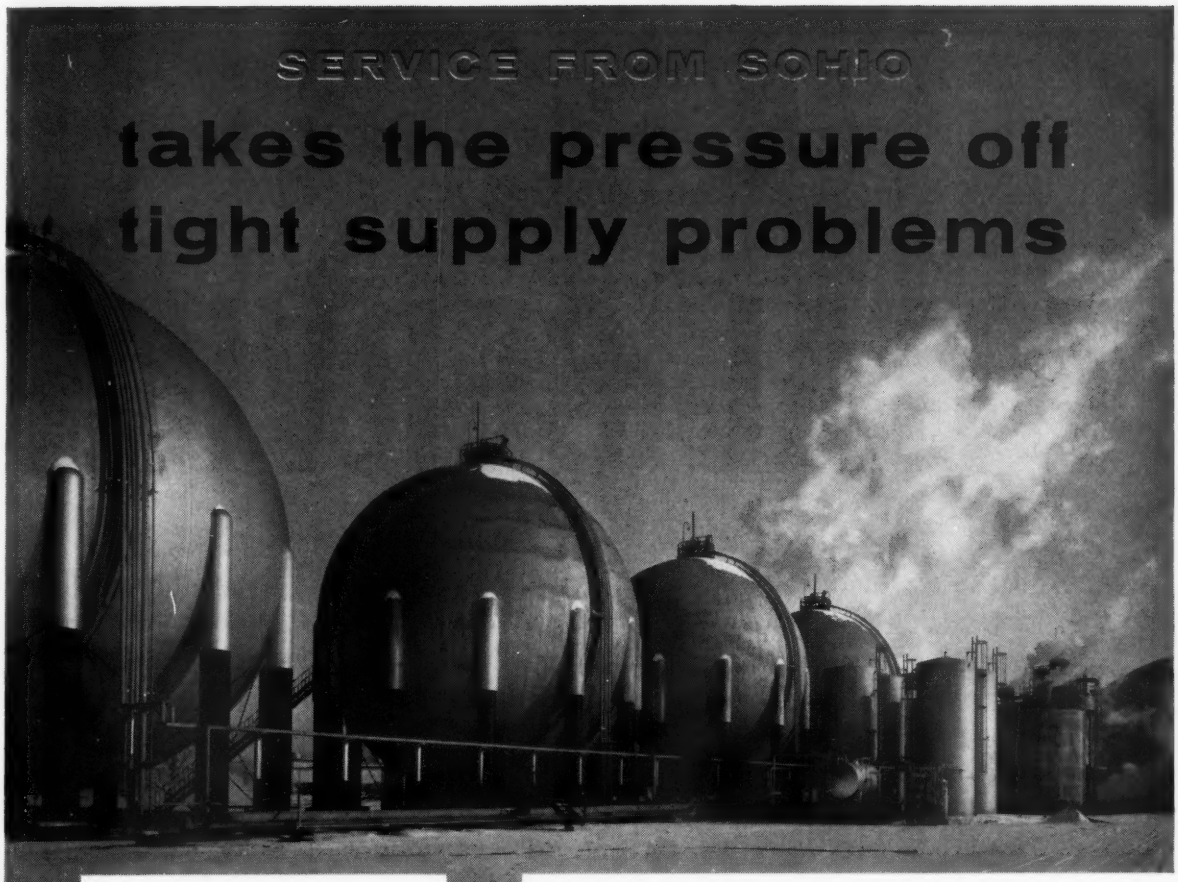
Strontium 90 residues in the samples, each from a different state, ranged from 138 to 806 micromicrocuries per kilogram. (A curie is a measure of radioactivity equivalent to that of one gram of radium. A micromicrocurie is one millionth of a millionth of a curie.) FDA says that's the most of this element so far detected in any food or food raw material. The states tested for strontium 90—all alfalfa samples—and the amount of residue in the samples: Minnesota, 806 micromicrocuries per kilogram; South Dakota, 797 units; Maryland, 600 units, and Nebraska, 138 units.

The maximum "permissable" level—which may be considered safe for human intake during a life-time is said to be 80 units established by the National Committee on Radiation Protection and Measurements. However, the Committee now advocates lifting the "permissable" level to 100 units. On the other hand, an international equivalent body wants it reduced to about 33 micromicrocuries.

FDA scientists said that a cow assimilates about 10 per cent of the amount of strontium 90 it consumes—eliminating the rest. Of the 10 per cent retained, most of it is said to stay within the cow—gravitating to the bone structure—with only a minute portion coming through in milk. They did not correlate tests in any of the states involved to see how much strontium 90 available in fodder eventually got through into milk.

An evaluation of FDA results, however, indicates that in Minnesota at least, cows may have gotten at least the 80-unit level experts now say is the border of safety for human intake. Furthermore, in a separate recent test of actual milk supplies in the St. Louis area, some of the milk shipped actually contained more than the 80-unit level. An Atomic Energy Commission spokesman pointed out that the hay tests were run after Operation Hardtack during which this country set off many atomic explosions. This would account for the high fallout of overall radioactive elements, many of which disappear quickly. But because strontium 90 remains where

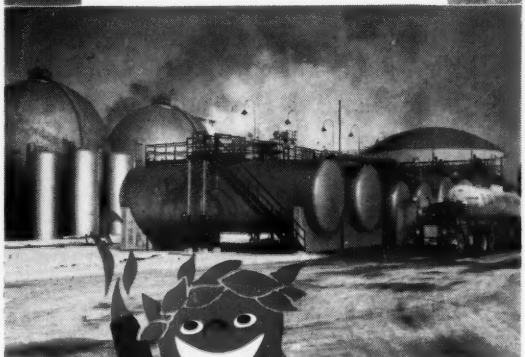
(*Continued on pgae 14*)



Sohio's storage facilities — largest in the country in relation to production capacity — keep nitrogen materials on tap for your peak season needs.

• • •

Sohio pioneered, and now sets new standards for speedy truck delivery of nitrogen materials.



SOHIO

6-59

WHEN you order nitrogen materials you naturally expect quick-time service and delivery. And that's just where Sohio shines.

Sohio's storage facilities — a continually expanding array of storage spheres, tanks and warehouses — provide an adequate inventory of nitrogen materials to meet your rush-season demands. Like clockwork, Sohio materials move out on the 5 rail lines serving the Sohio plant at Lima. Truck fleet delivery, developed by Sohio, gives you the fastest delivery possible.

A complete line of Sohiogen® Solutions, anhydrous and aqua ammonia and Sohigro® Urea meets your every requirement . . . gives you the full-range flexibility you need in manufacturing high-analysis finished goods.

These "ingredients" of Sohio SERVICE just can't be duplicated. Call the "Man from Sohio" today for details on how you can benefit from Sohio Service.

See Sohio first for high quality anhydrous ammonia—aqua ammonia—coated 45% or uncoated 46% urea—and 18 nitrogen solutions, including those containing urea. You want it—we have it.

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

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Modern fertilizer manufacturing ranges from a relatively simple to a highly complex chemical process both of which demand a complete and integrated service from basic suppliers. One company, alone, offers —

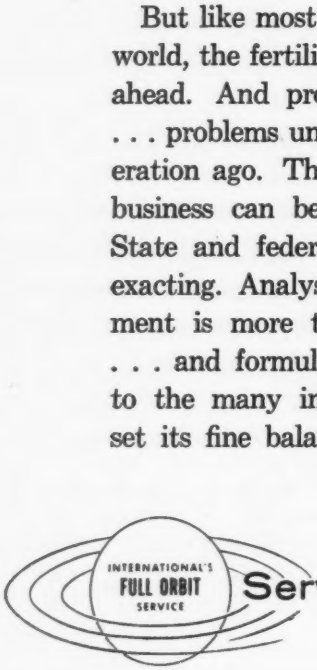
TOTAL SERVICE!

There was a time when a man would run a tidy fertilizer business from his roll-top desk. Purchasing, formulating, selling, shipping and bookkeeping added up to a busy . . . but manageable . . . job.

But like most everything else in this world, the fertilizer business has moved ahead. And progress brings problems . . . problems undreamed of just a generation ago. The technical side of the business can be enormously complex. State and federal standards are more exacting. Analyses go higher . . . equipment is more technical and intricate . . . and formulating is more sensitive to the many influences that can upset its fine balance.

It stands to reason that such a thoroughly integrated business can best be served by a supplier who recognizes its present-day complexity — whose interest, understanding and service takes in the *whole picture* rather than just one aspect or another. Because your manufacturing operation cannot be treated as a combination of unrelated activities, any attempt to do so runs the risk of jeopardizing the *whole* process.

That is the very reason IMC consolidated its services to the fertilizer industry. We understand the inseparable nature of modern fertilizer operations and submit that anything less than *total service* is risky service at best. Total service? It is unique to IMC. It



Serving the industry with the most complete

AGRICULTURAL CHEMICALS DIVISION

INTERNATIONAL MINERALS

Administrative Center — Skokie, Illinois

CAN YOU AFFORD LESS?

is the mark of a full-line company. It expresses itself in the sense of responsibility the IMC salesman feels in offering you any service that can contribute to the betterment of your business. It expresses itself through the IMC Technical Service staff — geared to treat *all* phases of your manufacturing operations whether they be concerned with nitrogen, phosphate or potash. It expresses itself through the IMC Transportation Department — ever searching out ways to improve the efficiency and reduce the cost of *all* your incoming and outgoing materials.

Putting it another way, IMC's *total service* is a true reflection of our Full Orbit philosophy. Its spirit pervades every contact you have with the people of IMC. Our every representative — whether he be salesman, technician, transportation expert or even president — has a mission of constructive assistance to perform each time he calls.

In short, the IMC man is a Man With a Mission!

50 IMC
1909
1959

Man with a mission is heading your way.
Look for him. Put him to work.

line of fertilizer materials

& CHEMICAL CORPORATION

What's Coming Next Month

With NAC members convening next month at French Lick, Ind., there's bound to be discussion about the veritable barrage of misinformation with which the unscientific mind copes daily. Most alarming is the propaganda being disseminated by the organic farming crowd. This group has become notorious for taking *out of context* worthwhile, objective information from well established publications and designing it to fit their own needs. FARM CHEMICALS was a recent victim.

Next month comes an article which no organic gardening enthusiast would touch with a ten-foot pole! It's our *NAC Issue Special* . . .

■ HERBICIDES AND WILDLIFE

This article will attempt to dispel the idea that there is necessarily a gulf between the use of pesticides in agriculture, forestry, or industry *and the best interests of wildlife conservation*. We will bring you the enlightening story of how one large chemical manufacturer successfully promotes its herbicide products as *tools* of the wildlife conservationist.

■ "THE MARKET MIX"

How is it possible for a large corporation with a myriad of diverse products to *keep track of them all*—let alone to *market* them effectively? This, the first in a new series, will explain an effective over-all successful marketing concept—which this corporation's marketing experts refer to as their *marketing mix*. Watch for this new series.

. . . in the new

FARM CHEMICALS

BPA

WASHINGTON VIEWPOINT

fallen for about 28 years, later tests would not show lower concentrations of that element.

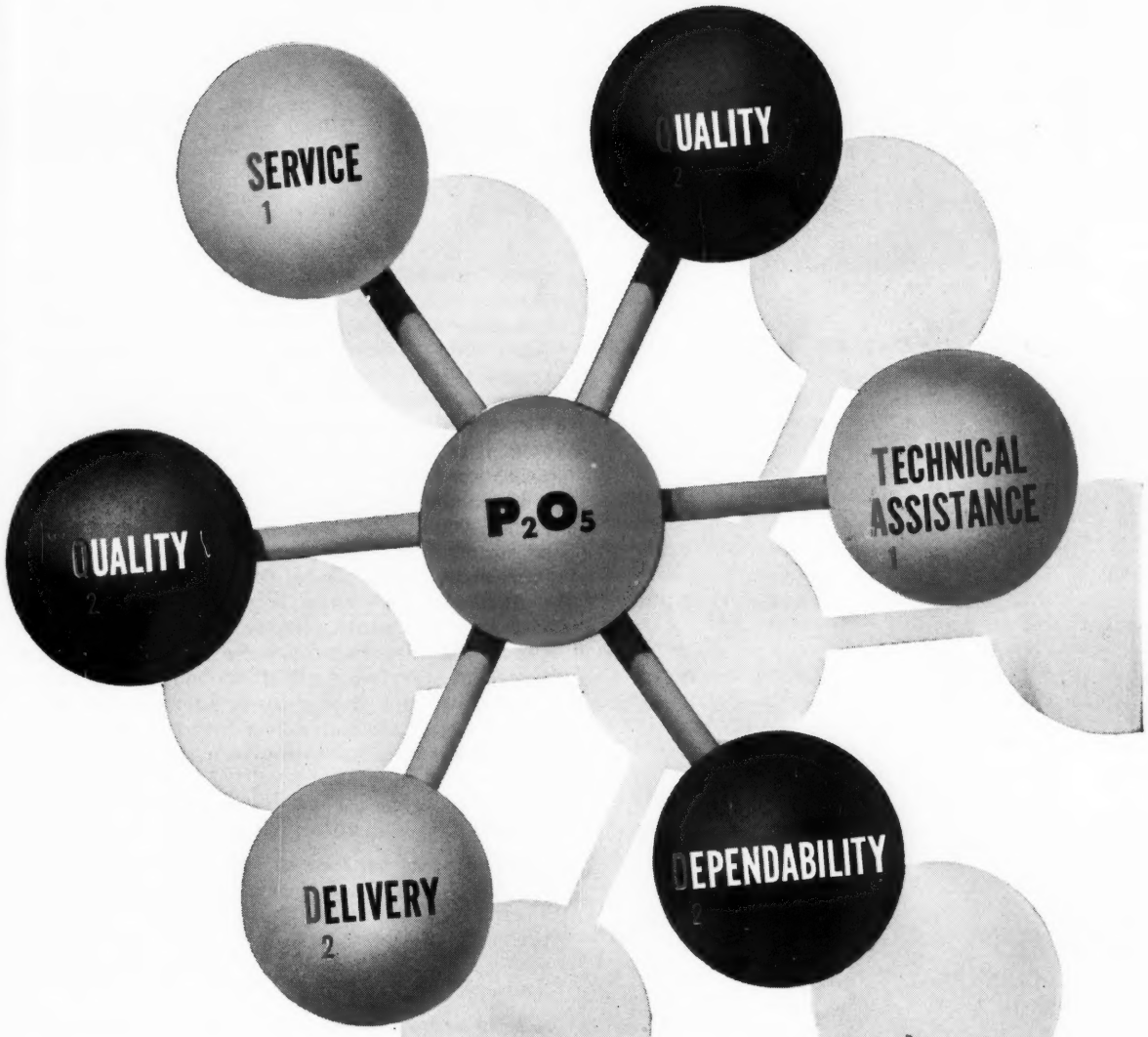
Following are the 19 states tested for total radioactive elements, and the levels in micromicrocurie units: *On alfalfa*—Minnesota, an average of 58,000 units for samples taken; Nebraska, 10,000; Ohio, 30,000; Indiana, 29,000; Colorado, 37,000; South Dakota, 37,000; Wisconsin, 29,000; Illinois, 20,000; Arizona, 2,000; Tennessee, 45,000; Virginia, 11,000; Maryland, 15,000; West Virginia, 11,000; and New York, 34,000. *On ensilage*—Kansas, 10,000; Washington State, 1,000; Iowa, 3,200; Missouri, 13,000; and Oklahoma, 3,200.

Now that Congress has failed to make any progress in solving the farm problem, you can expect strong drives from both parties to forestall another downward trend in farm income in the future. While little legislation of any consequence will be enacted in 1960—both parties now are aiming at 1961. Indications are that both will promise to push for higher farm income during the campaign season in 1960. Chances are the farm income situation in 1960 will be such that they will be forced to make good on campaign promises for the general economic good.

Indications as to 1960 farm income—which means spending power for production items—are that net farm income will be down ½ to 1 billion dollars from this year's estimated $12.1 billion. The political promises will be to reverse the 2-year downtrend. The Republican presidential nominee, whoever he may be, will have a hard time convincing farmers that he means what he says. The reason is President Eisenhower's failure to make good on his 1952 promise to get 100% of parity prices in the market place. Farm prices now are running at 81% of parity, compared with 92% when he took office. Democrats, for their part, will have a hard time explaining their failure to make any convincing efforts at farm legislation in view of their ⅔ majorities in both Houses.

Upshot in 1961 is that the government will take an even more active part in farm matters than it now is taking. Such things as a bigger Soil Bank seem sure to be enacted. A general bi-partisan effort is likely to evolve aimed generally at pumping more federal funds directly into the farmers' hands. For the farm chemicals industry, this means that demand for production items will ease off in 1960—but thereafter, another big upsurge in farm spending, resulting from new—if artifically-created—prosperity on the farm. The 1960's are likely to bring on a boom in farm production and spending almost unparalleled in modern farm history.

The U.S. government is turning increasingly to using bugs to kill off other bugs. Latest example is importation of West German beetles, known as Laricobius beetles, for use in destroying the balsam wooly aphid which has been raising havoc with fir trees in Washington, Oregon and North Carolina. Laricobius prey on aphids and will be released in Maine and North Carolina as an experiment. Officials hope they will multiply so that colonies can be sent soon to all infested areas.



The DAVISON formula is more than just Quality of product

Make no mistake, we do not underrate the importance of quality. We know that the Davison Hi-Flo Triple Supers (Run-O-Pile, Gran-U-Lated and Blend-Phos); Davison Normal Supers; Phosphate Rock and Phosphoric Acid are unexcelled by any on the market.

But Davison considers that the important "pluses" . . . Service, Quality, Dependability, Delivery, Technical Assistance are equally important in determining a source for your needs. We consider them all parts of our product.

W.R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MARYLAND

Hi-Flo Run-O-Pile Triple Superphosphate . . . *46/47% available P_2O_5.*

Hi-Flo Gran-U-Lated Triple Superphosphate . . . *guaranteed 46% available P_2O_5.*

Hi-Flo Blend-Phos Triple Superphosphate . . . *45/46% available P_2O_5.*

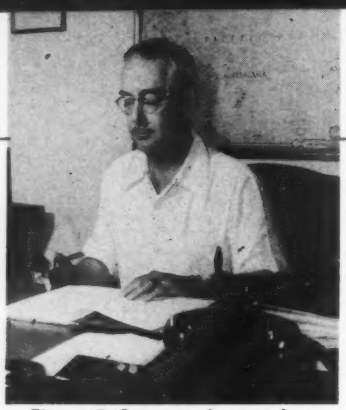
Granulated Normal Superphosphate . . . *guaranteed 20% available P_2O_5.*

Run-of-pile Normal Superphosphate . . . *Approx. 20% available P_2O_5.*

Phosphate Rock *All Grades.*

Phosphoric Acid
75% H_3PO_4—54.5% available P_2O_5.

The HAYES-S



Thomas B. Sammons, Jr., president

C. B. Brazeal, vice-president

THE "country boys from down on the Rio Grande" responsible for the 219 per cent increase in Hayes-Sammons Chemical Company sales the past four years, didn't mention the word *motivation* once in a recent FARM CHEMICALS interview. In talking to Thomas B. Sammons, Jr., president of the Mission, Texas, pesticide company, however, it became very evident to the author that *motivation has been the big prime mover behind the Mission Brand label.*

Examining the local telephone directory, for instance, you'll notice that all division heads are listed separately. Not many companies single out their individuals for this kind of recognition!

Another unique factor is that every salesman is virtually a king. In fact, they're called *sales managers.* They are trained to meet any crisis in the field and take action "on the spot" without getting bogged down in red tape or channels of communications.

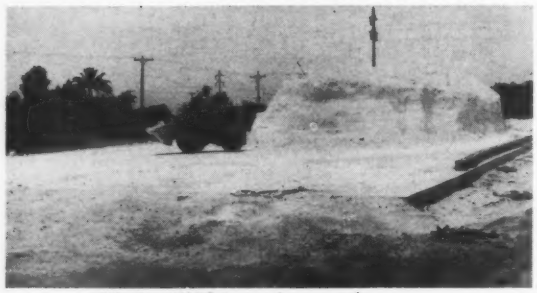
A customer seldom, if ever, hears from the home office without the sales manager's knowledge.

Thomas B. Sammons listed several other factors as being responsible for the terrific increase in sales—from $2,658,658 in 1954 to $8,576,911 last year:

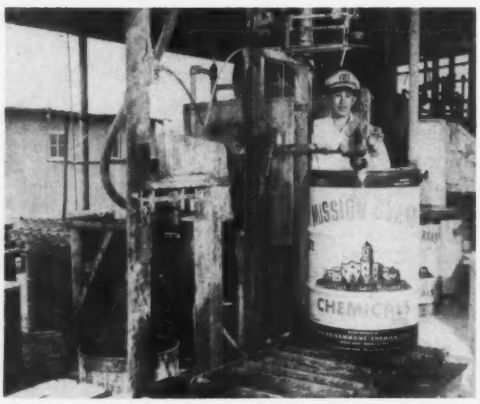
▶**The basic concept of sound overall planning** is the foundation of their sales increase, he said. Their planning involves these five basic factors: 1) production, 2) personnel, 3) sales and marketing, 4) advertising and merchandising, 5) research and development.

▶**Decentralization of their marketing program,** with specific responsibilities assigned to each individual, has made Hayes-Sammons a hard-hitting sales organization.

Although the rapid growth of the company has paralleled a big boom in development and use of



Hauling BHC from a big outside storage pile to be mixed with other insecticides.



Photos by A. B. Kennerly

◀ **Liquid chemicals** are shipped in drums. The mild climate through the year makes it possible to keep the sides of the mixing rooms open.

▼ **Workers are protected** against inhaling dusts. Bags are printed for use in both the U. S. and Mexico.

S-SAMMONS *Story*

STAFF REPORT in cooperation with A. B. KENNERLY

organic insecticides, much of its progress has come from a *team-work approach* to aggressive planning and merchandising. These combined to gradually transform a hardware store, established in 1905, into one of the nation's largest formulators of pesticides.

"The trend began in the 1920's when Hayes-Sammons acted solely as a distributor of such chemicals as calcium arsenate, paris green and sulfur," recalls Sammons, who heads an organization which now serves farmers in states of the South as well as foreign countries.

"The growing acceptance of scientific farming, which requires the use of increasing amounts and varieties of insecticides, fertilizers and other farm chemicals, has stimulated aggressive policies for expanding the activities of the company," he continued.

Today, the company operates through three divisions: agricultural chemicals, home and garden chemicals, and chemicals for the oil and gas industry. But foremost is its agricultural chemicals division that has grown rapidly since World War II.

The cotton growing industry in the Lower Valley has stimulated a huge demand for cotton fertilizers and insecticides. Four counties, comprising the Lower Rio Grande Valley, produce around 400,000 bales of cotton annually. In addition are thousands of acres of winter vegetables such as cabbage, carrots, onions and tomatoes. The land is irrigated from water storage in the Rio Grande impounded by Falcon dam completed in 1955, which also serves the farmers on the Mexico side.

EXPANSION TO THE MISSISSIPPI DELTA

In 1957, the company expanded to include the Dixie Division with a plant at Indianola, Mississippi. This plant produces and distributes farm chemicals in the Mississippi Delta and surrounding areas.

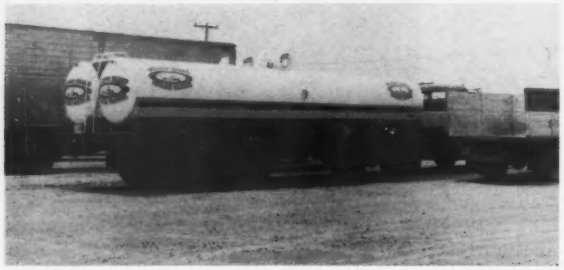
Liquid fertilizer was added to the Mission Brand line in 1955. All facilities to produce liquid fertilizer at the present time are located at the Mission plant, where the company also assembles equipment for fertilizer application. Equipment is sold direct to the farmer, or it may be loaned out.

In addition to the two plants in this country, a plant was completed in 1951 in Cd. Reynosa, Mexico, just across the border from Mission.

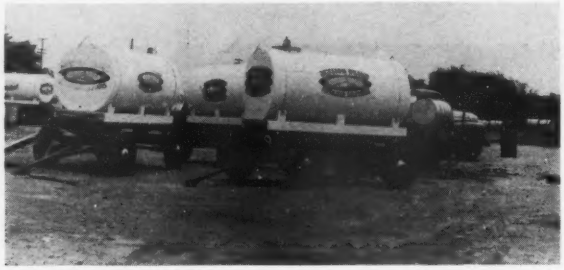
Virtually all sales of farm chemicals are made through 300 dealers in the Texas area, 150 in the Dixie Division and about 150 dealers in Mexico. Dealer organizations include cotton gins, feed and seed stores, farm implement and hardware stores, airplane applicator companies, and cooperatives of various types. Of the 24 entomologists and agronomists employed by the company to advise dealers and customers in various aspects of scientific farming, 15 are in the United States, 8 in Mexico and 1 in Central and South America.

(Please turn page)

Dryer at the Hayes-Sammons plant in Mission. George McBee, Texas A&M agronomist, tours the plant with Pat Hitt, in charge of H-S home and garden chemicals.



Chemical fertilizers are shipped in big truck tanks.



These trailers are left on farms where fertilizer is mixed with irrigation water.

"THE PLUS ASSETS OF LEADERSHIP"

"It is our belief that any organization is built on *people*," explained Sammons. "We endeavor to staff our organization with capable and dedicated personnel. Our sales staff members are college graduates, trained in the fields of entomology and agronomy. We look for the plus assets of leadership—the ability to get along with people, a persuasive personality, the stature to accept increasing responsibility and the inclination to be a 'self-starter.'

Each applicant takes an aptitude and psychology test after personal interviews. The company places maximum emphasis on sales personnel selection as they look to their sales force as the reservoir for future management and executive leadership.

To back their belief that people make an organization, they have a profit-sharing retirement plan and many employees own stock in the company.

An aggressive advertising and public relations program paves the way for the sales force. Each year an *overall sales goal* is set up and the advertising budget is based on the projected goal. In other words, *what will it take to reach the sales goal?*

"Our primary advertising emphasis is on spot radio and spot television during or around weathercasts. Farmers are interested in the weather," Sammons emphasized.

"In our printed material we constantly keep the farmer in mind. How can he make more net profit per acre? Instructional booklets, which are also printed in Spanish for the border and export markets, are considered part of our sales program."

EFFECTIVE MERCHANDISING AID

The company devised the "Dial-A-Bug," a four-color booklet that takes the guesswork out of recommending the proper insecticides. It shows the most common insects that attack plants and infest homes and is published in both English and Spanish. It accompanies a display rack for the Mission Brand products recommended in the merchandising aid.

A recent product of their research program is Dynatox, a "one product control for all cotton insects." According to Sammons, "with the use of this formulation the farmer does not have to make numerous complicated mixtures at his field for the control of various cotton insects."

The opening of the Dixie Division in Indianola, Mississippi, illustrates the aggressive planning that has accelerated sales during the past four years. Working closely with the advertising agency, Hayes-Sammons outlined a complete detailed plan for the opening of the new plant. A timetable was set up and responsibility for each function of the plant opening was assigned three months in advance. Plant and advertising agency personnel went to Indianola and each step of the opening celebration was planned and coordinated with the cooperation of local citizens well in advance.

A public celebration was staged to "welcome Hayes-Sammons as a good community neighbor." An open house of the new facilities was scheduled and all officers of the home office were on hand to welcome farm families—the potential customers of the company.

A dinner meeting of dealers and their wives was held, followed by an entertaining demonstration of the product line. Leading state agricultural officials took part in the opening day celebration and the resulting publicity covered a four state area.

HOW THEY HELP THEIR DEALERS

Hayes-Sammons maintains a program of cooperative advertising, leaning toward radio and television spot announcements, some newspaper advertising, highway signs, point of purchase materials, instructional folders, site signs and assistance in area exhibits.

"Our program of direct sales assistance to dealers includes field inspections, soil testing, leaf analysis, insect count and recommendations for controls. We also conduct area farm clinics to instruct our dealers' customers on the proper use of chemicals and how they can bring additional profit to the farmer," Sammons explained.

What of the future? Sammons put it this way:

"Increasing population will result in an increased need to raise more products from the soil for food, clothing and shelter. This will naturally lead to an increase in the use of pesticides. Agriculture has become big business and farmers have learned that they, too, must become more efficient in their operations."

Sammons believes that the profit picture for the farm chemicals manufacturer will improve as cost control programs improve the efficiency of his operation. Marginal product lines will be more closely scrutinized and eliminated if they contribute only nominally to earnings.

Although Hayes-Sammons has come a long way since it first operated as a small hardware store, its bigness is not likely to overshadow its personal touch with its employees and customers ▲

CYANAMID'S TRAFFIC EXPERTS ARE AT YOUR SERVICE

...to help deliver phosphate rock when you need it...as you need it

Branch order service. There's no side-tracking of orders in "head" office when you call, wire or write for Cyanamid's phosphate rock. Simply place your order direct with your nearest Cyanamid branch office for immediate personal attention and swift forwarding to point of shipment, Brewster, Florida.

Cyanamid's Technical Staff is on call whenever you need it. Let us help you solve knotty manufacturing problems. Call or write for this free service.

Ask for grade... all our production is high grade, ranging from 77% B.P.L. down to 72% B.P.L. Our rock is quality controlled by specialists and blended to your specifications. Rock is also ground to order and a screen analysis of each car sent before shipment.

Why not call us today? American Cyanamid Company, Agricultural Division, 30 Rockefeller Plaza, N. Y. 20, N. Y.

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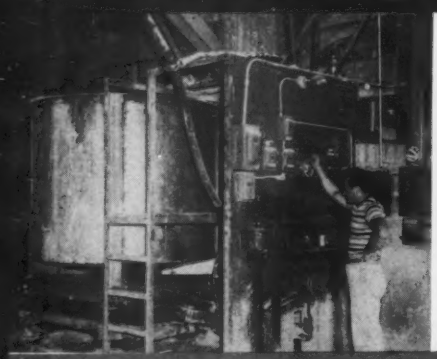
MARKETING

manufacturing and handling dry goods



Plant superintendent operates control

Employees on position at the automatic fer-

Power conveyers take the bagged fertilizer

Star Fish and Bone Fertilizer Company:

Servicing "future business"

"WE MAY PROVIDE certain farmers with many of our services for any number of years before they actually become our customers," explains David Lourie, secretary of Star Fish and Bone Fertilizer Co., Bridgeton, N. J., "but we feel that this is part of our selling program. Just going out and asking a farmer to buy fertilizer will not bring in his business, and we don't intend getting this business by making severe price concessions because neither we nor the farmer will benefit by it. The old saying, that "A customer only gets what he pays for" holds true even in the farm chemicals business. Service is a factor that farmers need and the fertilizer dealer should give it, and only by fair pricing to all, can the customer as well as the dealer enjoy the proper benefits."

The Star Fish and Bone Fertilizer Co., dates back to its founding by Max Feinstein in 1907. At that time, the principal ingredients in fertilizer were star fish and bone from which the company received its name. Methods of mixing were crude at that time—all of it was done by hand and with the help of shovels for mixing. Fertilizer was picked up at that time by farmers. For those that wished delivery, the dealer used a horse and wagon.

THE MOVE TO LARGER FACILITIES

Business kept expanding, and by 1936, it was necessary to move into an enlarged plant. A suitable building was found at the edge of town which was deemed to be a worthwhile location. It provided a focal point of distribution to all of the South Jersey areas served by this fertilizer producer.

As various types of plant equipment became available, it was added by the firm to take advantage of greater productivity, reduced labor costs and mixed fertilizers that were consistently uniform.

Within the last two years, the plant has been greatly expanded and new equipment installed which provides it with a capacity for 100 tons of fertilizer daily. All operations are done by "push button" which provides practically complete automation of processing. Additional equipment includes four delivery trucks, four dry spreaders, a liquid spreader, power shovels and diggers. An average of 25 employees are on duty all year round with an additional 10 employees during the height of the season.

BITZER'S ASSISTANCE TO FARMERS

A recent addition to the staff has been Aubrey Bitzer, a graduate of Rutgers University. He maintains steady contact with customers and non-customers and assists them whenever possible. Soil testing, making fertilizer recommendations and bringing other information to the farmer is part of his job. It isn't uncommon for Bitzer to spend hours and days with the farmer who has never purchased any fertilizer from this manufacturer. That this service pays off, has been proven by the number of new farmers who are buying fertilizer from Star each year for the first time—even though they have been in the area for many years previous.

"We feel that it is very important for a fertilizer manufacturer to 'give' first before he can 'receive'—and by giving I mean service," explains Lourie. "Helping a non-customer with his problems and maintaining constant contact with him is the best way of eventually making a customer of him. By the same token, this service is the best way of maintaining a customer's loyalty to the manufacturer.

Aerial view of the Star Fish & Bone Fertilizer Company plant at Bridgeton, New Jersey.

By JACK KERNS

Having a full time serviceman in the field is an important public relations factor that contributes greatly to the growth of a fertilizer manufacturer's business."

Two salesmen are constantly covering the territory, and anytime they cannot give the customer or non-customer the assistance that he needs, Bitzer is told of it. Farmers appreciate having someone take a personal interest in their problems, and this is an excellent way of building customer loyalty.

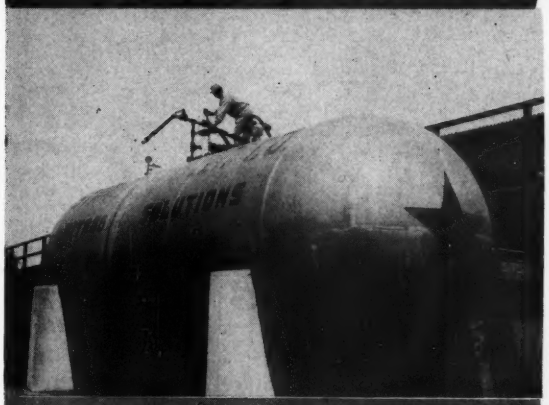
Each month, the firm turns out the "Star Farm News" which is a four page mailer sent out to all customers and non-customers alike. This bulletin brings to the farmer a host of information which includes technical data, fertilizer analysis for various crops, acknowledgement of cummunity affairs and even humorous sayings. This year-round bulletin helps to maintain steady contact between the farmer and this manufacturer which helps to build up a closer relationship and pays off in continuing business.

GEARED FOR LIQUIDS

In offering customers a "complete" fertilizer service, this firm means complete! Even though liquid fertilizer is more a topic of discussion by the farmer in this area than is its actual application, Star Fish and Bone is already geared up for liquid fertilizer application. This is in addition to the pelletized fertilizers and the other varieties which are staple products with them.

Two 20,000 gallon storage tanks have been added to the dry fertilizer mixing plant and brought to the attention of farmers through the firm's normal advertising mediums. This includes highway billboard signs, advertising in the weekly farmer news-

applying liquids



Liquid N storage tanks are located to the front of the plant, so farmers can recognize that Star handles solutions.

Above, liquid fertilizer is being loaded into the spreader truck; below, it is being spread over an alfalfa field.

papers, telephone directory listings and mention in the monthly Star Farm News. A five ton liquid fertilizer rigger was also added at the same time to take care of spreading.

"Regardless of what the volume of liquid fertilizer sales is, it must be available to the farmer if a fertilizer manufacturer is to claim that he can provide 'complete' fertilizer service to his customers," explains Lourie. "Before farmers in this area make a change or decide to use a different type of fertilizer, they like to talk about it, discuss it with other farmers and know where it is available before they actually apply it. Therefore, regardless of what the sales situation is, the product must be available if it is to be sold at any present or future date. We have been getting in some calls for liquid fertilizer and feel that these will keep increasing as more farmers become acquainted with it."

Storage tanks, of 500 gallon capacity, have already been acquired by Star Fish and Bone Fertilizer Company for loan to customers who intend to use liquid fertilizer. These tanks will be loaned to farmers who intend to "do it themselves."

Dry fertilizer is sold in four ways. First, it can be delivered by a bulk spreader truck and spread, (2) it can be delivered to the customer in bulk or (3) it can be delivered bagged. (4) Farmers making their own fertilizer pick-up can save in the neighborhood of $2.00 or more a ton.

FARMERS REQUEST SPREADING

About 15 per cent of the farmers who have fertilizer delivered request spreading service. This cost is absorbed in the price of the fertilizer. The bagged price is charged—with the delivering and spreading being done by the bulk spreader truck. This is the difference which pays for the spreading service. Each farmer has his own idea of how he wishes his fertilizer to be delivered and spread—with many of them varying from one year to the next. Being set up to handle all of these requirements almost immediately upon request, has made this fertilizer manufacturer more important to the farmers in the area.

Custom mixing is an important function at this plant. Many large tonnage users specify their own

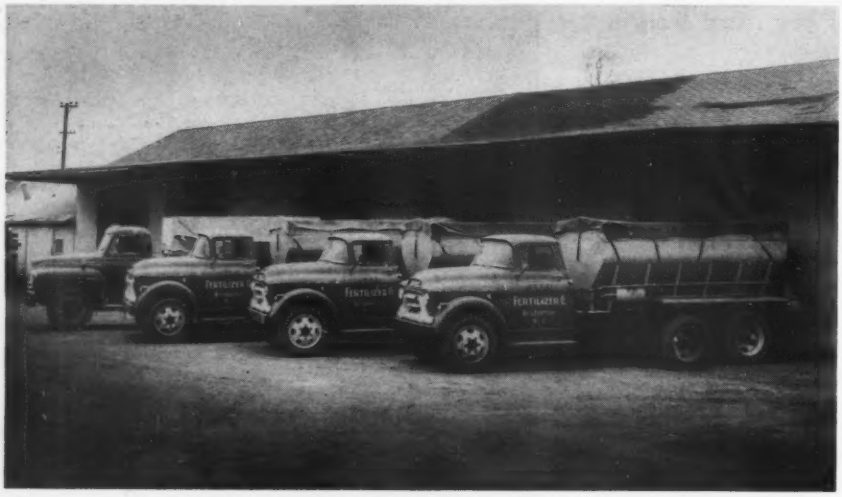
The plant is located on the "edge of town," making it a convenient site for farmers to visit.

formulas or have the company's agronomist prepare one for them. Four premium brands of fertilizer and thirty-one standard grades are offered regularly. Large stocks of all varieties of minerals and materials are regularly stocked so that additional minor elements can be introduced into fertilizers upon request.

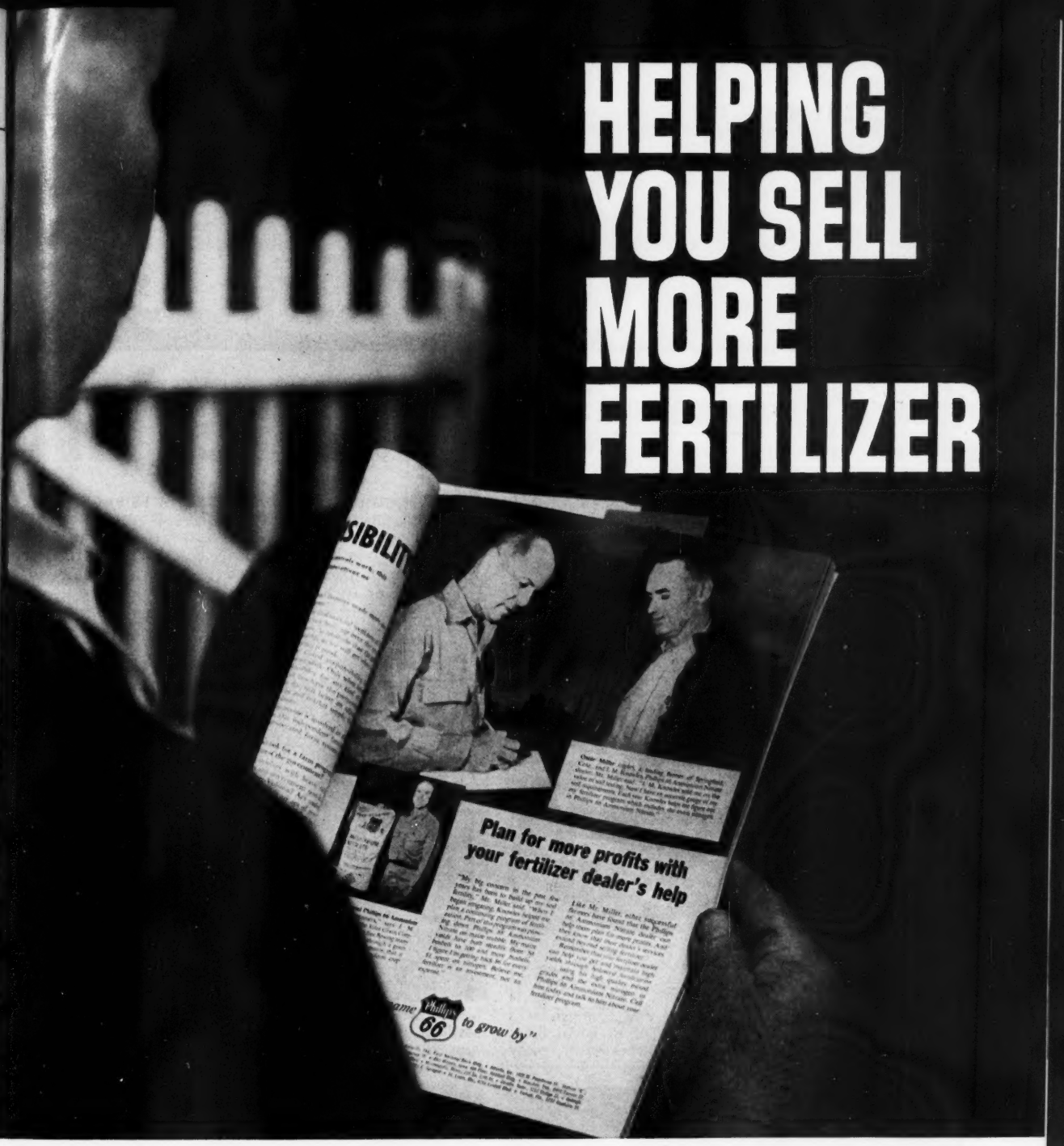
The most popular formula in custom blending is 5-10-10 with traces of additional minor elements. For the major variety of crops being raised in this area, such as tomatoes, potatoes and onions, the 5-10-10 formula and the 6-12-6 formula are the most popular.

From February to August, this firm enjoys its heaviest productive period. During the balance of the year, new stocks are laid in, plant and equipment maintenance goes into effect and the over-all merchandising and management policies are checked over for the approaching season.

"However, our personalized attention and personal contact with customers and non-customers alike still continues," adds Lourie. "We attend farm meetings, have representatives at the experiment stations and, otherwise, keep our finger on the pulse of the farming situation in South Jersey. Maintaining this contact with farmers, as well as being geared up to handle their requirements when the time arrives, is the major factor that has made our firm almost a 'part' of every farmer's activities in this region." ▲



These bulk spreader trucks are being used more and more, the New Jersey manufacturer reports.



PHILLIPS 66

"A good name to grow by"

This farmer is reading a Phillips *66* Ammonium Nitrate ad. Although it advertises the superior qualities of Phillips *66* Ammonium Nitrate, it also emphasizes farmer-dealer planning of a balanced fertilization program . . . and the importance of good soil management through the use of mixed fertilizers as well as supplemental straight nitrogen.

In 1959, most of the Nation's farmers will see these "farmer-dealer-planning" ads in leading magazines like CAPPER'S FARMER, FARM JOURNAL, and FARM AND RANCH.

But then, promoting better farmer-dealer relationship and increased use of mixed fertilizers is just one of the many ways in which Phillips helps fertilizer manufacturers. For example, Phillips will assist in sales meetings for your salesmen and dealers . . . provide skilled technical assistance . . . compute your formulations on its electronic computer . . . and, of course, give you dependable delivery of high quality Nitrogen Solutions, Anhydrous Ammonia, Ammonium Nitrate, Ammonium Sulfate, and Triple Superphosphate.

PHILLIPS PETROLEUM COMPANY, *Phillips Chemical Company, a subsidiary, Bartlesville, Oklahoma*

Sales Offices: Amarillo, Tex., First Nat'l Bank Bldg. • Atlanta, Ga., 1428 West Peachtree St., Station "C" P.O. Box 7313 • Bartlesville, Okla., Adams Bldg. • Chicago, Ill., 7 South Dearborn St. • Denver, Colo., 1375 Kearney St. • Des Moines, Iowa, 6th floor, Hubbell Bldg. • Houston, Tex., 6910 Fannin St. • Indianapolis, Ind., 3839 Meadows Drive • Kansas City, Mo., 201 E. Armour Blvd. • Minneapolis, Minn., 215 South 11th St. • New York, N. Y., 80 Broadway • Omaha, Neb., 3212 Dodge Street • Pasadena, Calif., 317 North Lake Ave. • Raleigh, N. C., 401 Oberlin Road • Salt Lake City, Utah, 68 South Main • Spokane, Wash., 521 East Sprague • St. Louis, Mo., 4251 Lindell Blvd. • Tampa, Fla., 3737 Neptune St. • Tulsa, Okla., 1708 Utica Square • Wichita, Kan., 501 KFH Building

DISCOVERY OPENS NEW ERA FOR PAPER

NOW, PAPER THAT S

DROPPED CAN crashes through ordinary paper which lacks stretch, but bounces off CLUPAK paper of equal basis weight. Unlike creped paper which stretches easily, every fiber of CLUPAK paper resists as it stretches.

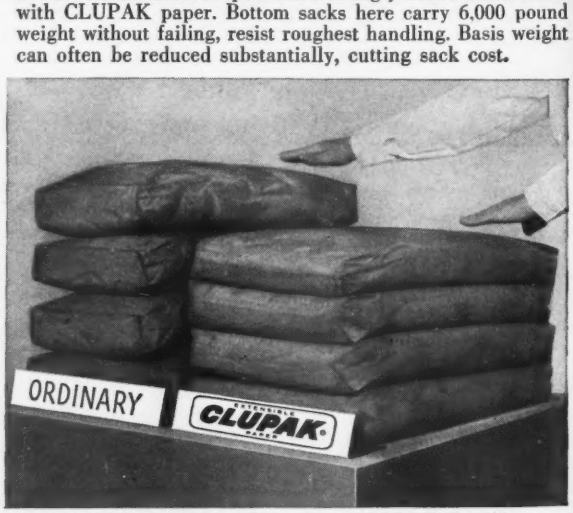
NEW TOUGHNESS, FLEXIBILITY CUTS PACKAGING COSTS, INSPIRES NEW PRODUCTS.

Until the invention of CLUPAK Extensible Paper, paper has just been strong. It resisted the energy of impact until it ripped or tore. But now paper can also be *tough.* CLUPAK paper has a built-in stretch that lets it absorb energy that otherwise would cause it to break.

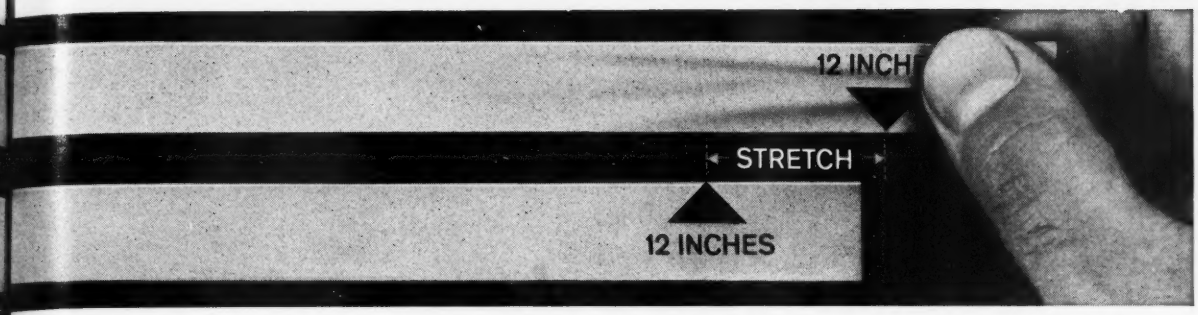
Because CLUPAK can be almost any type or basis weight

MULTIWALL SACKS perform strikingly better when made with CLUPAK paper. Bottom sacks here carry 6,000 pound weight without failing, resist roughest handling. Basis weight can often be reduced substantially, cutting sack cost.

GROCERY BAG of ordinary kraft splits, spills contents after drop, but the much tougher CLUPAK paper bag absorbs shock, remains intact.



STACK COMPARISON shows how CLUPAK flexibility enables multiwall sacks to fill better, for many products, saving up to 25% of space needed for storage and shipping.

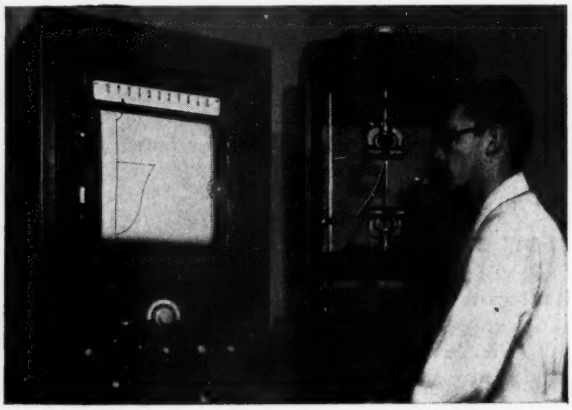


STRETCHES

of paper, with varying controllable degrees of stretch, it transforms conventional paper into virtually a new material—one with almost unlimited possibilities.

CLUPAK stretch is already giving multiwall sacks, grocery bags, magazine wrappers, paper-base pipe and laminates, shipping containers and many other products spectacularly better performance and lower costs. And the flexibility of CLUPAK papers can also mean startling savings and advantages in many uses and situations.

But these applications of CLUPAK Extensible Paper are only the beginning. CLUPAK is the most exciting new word in paper. The "give" it adds to paper opens a new era, invites a thousand new products and design improvements. We suggest you investigate the potential of CLUPAK for your business. It will pay you to consult your paper supplier. Our licensees, who make CLUPAK paper, are listed below. ***Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.***



UNIQUE TEST machine measures and graphs far greater toughness of CLUPAK paper. Printability, surface friction, porosity and other properties of CLUPAK paper can be controlled as with conventional paper.

KEY FACTS FOR BUYERS

1. CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible. Its built-in stretch accommodates strains that break ordinary kraft.
2. This increased toughness, for example, allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies.
3. CLUPAK, INC. conducts research and development activities and advises licensees on technical matters.
4. CLUPAK, INC. permits the use of its trademark EXTENSIBLE CLUPAK PAPER only on paper which meets this company's rigid toughness requirements.

TRADEMARK "CLUPAK" is your assurance that paper will deliver remarkable CLUPAK benefits. Look for it, expect it.

BE SURE TO LOOK FOR THIS TRADEMARK

EXTENSIBLE
CLUPAK®
PAPER

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

You can now get CLUPAK paper and products made with CLUPAK paper from

ALBEMARLE PAPER MANUFACTURING CO.
CALCASIEU PAPER CO.
CANADA PAPER CO. *(Canada)*
CROWN ZELLERBACH CORP.
CONTINENTAL CAN COMPANY, INC.
DYNÄS AKTIEBOLAG *(Sweden)*
HUDSON PULP AND PAPER CORP.
INTERNATIONAL PAPER CO.
ST. LAWRENCE CORP., LTD. *(Canada)*
ST. REGIS PAPER CO.
UNION BAG-CAMP PAPER CORP.
WEST VIRGINIA PULP AND PAPER CO.

What's in it for ME?

WHAT DOES a million-dollar Selling Point sound like? Like this: 1) "Our garments retain the same modulus and hysteresis characteristics even after six months' exposure to body oils, soaps, detergents and oxidizing atmospheric gases."

2) "This alloy covers steel with a film of chromium oxide."

3) "We add aluminum glycinate and magnesium carbonate to our acetylsalicylic acid."

4) "The wide-spaced wheels give our cars a lower center of gravity."

These selling points really brought home the bacon! They have sold literally hundreds of millions of dollars' worth of girdles, stainless steel, buffered aspirin and automobiles. Each sums up a distinctive superiority that gives the product a commanding edge over the competition.

But before each of these gilt-edged clinchers could exercise its persuasive magic, some crack salesman had to listen to it with his prospect's ears, then answer the question, "Yes, but—what's in it for me?"

And this is what he said:

1) "These girdles *won't lose their shape.* They keep you looking *younger—longer.*" (Playtex Foundations).

2) "By shielding steel from the water vapor, salt and sulfur gases in air, you get corrosion-resistant, or '*stainless,*' steel. It keeps looking *new and shiny, lasts longer, needs less care than other steels.*" (Vanadium Corporation of America).

3) "Because these compounds combat certain side effects of aspirin, Bufferin *won't upset your stomach.*" (Bristol-Myers).

4) "Its hug-the-road stance gives you *a smoother steadier, safer ride.*" (Pontiac).

That salesman obviously knew—

WHAT CUSTOMERS WANT MOST

People don't buy *things;* they buy what things will do for them. They buy enjoyment, fulfillment, satisfaction, solutions, performance, advantages, benefits. People *never* buy a product. They *always* buy a result. It's their only incentive for parting with money.

Basic stuff? Perhaps.

Yet, the truth is: an incredibly high percentage of salesmen fumble their opportunities because they plug product features instead of selling customer benefits.

Frequently, there is just one reason for this costly oversight. They don't know—or have forgotten—

THE DIFFERENCE BETWEEN A FEATURE AND A BENEFIT

Salesmen tend to become intrigued with technical superiority in the jargon of their trade. They overlook the fact that the average farmer is far more interested in getting a higher yield per acre than in a learned dissertation on soil chemistry. They ignore the human desire for economy and, instead, stress the modern equipment used in their plants.

"But," some men protest, "I tell my prospects all the good things I can about my product."

"From whose viewpoint?" asks Ralph Werley, sales manager of Jefferson Chemical Co. "How a product is put together or how a company operates is of no direct interest to a prospect. Only one subject

That's what the prospect really wants to know—yet many salesmen bark up the wrong tree, by plugging product features instead of RESULTS.

By TED POLLOCK

in the whole wide world holds instant, absolute appeal for him: himself. Describe the great new packaging of your product and he'll think, 'That's nice,' nothing more. But show him how his costs will be slashed as a *result* of that packaging and you'll collar yourself a receptive audience eager to buy. In the first case, you're talking about a feature; in the second, about a benefit.

What's the difference?

A *feature* is a built-in detail of a product or service.

A *benefit* is the satisfaction of a need or want which a product or service is able to provide.

The Feature relates to the product, the Benefit to its enjoyment. The Feature is what interests the manufacturer; the Benefit is what interests the customer. The Feature is the "train"; the Benefit is the "destination."

Some examples:

FEATURE	BENEFIT
Liberal terms	For as little as $20 down, you can put this fertilizer to work for you.
Good drilling qualities	Our plant nutrients apply more uniformly.
Fertilizer plus factors	One nutrient stimulates the uptake of another.
It's "super dry"	This ammonium nitrate can't clog in the spreader.
Conveniently located warehouses	Quick delivery.

In short, the Feature is what makes the Benefit possible. That's why—

A GOOD SALESMAN IS A GOOD TRANSLATOR

"When our dealers approach a company," reports George W. Haag, vice-president of Facit, Inc., "they don't point out the Swedish steel construction of our machines and stop there. It wouldn't *mean* anything to many prospects. Instead, they go on to translate Swedish steel, among the world's toughest, into deeply personal benefits for the customer—in this case, no breakdowns, no down time. A modern business can lose a lot of time and money if its calculating machines conk out. Our dealers emphasize that parts made of Swedish steel practically eliminate that worry. In other words, they *mention* the feature but *spotlight* the benefit it makes possible. That's when ears perk up and orders are signed."

In solid agreement is Richard Tamney of First Investors Corp., who says, "In my opinion, one of the salesman's chief functions is to bring good news to a prospect. But when a buyer's native tongue is English and the sales message comes through to him in Greek, the result is a foregone conclusion—no sale.

"The fact that a mutual fund offers investment diversification may be news to an unsophisticated investor, but until the salesman explains *how* diversification protects him, the prospect has no way of knowing whether the news is good, bad or inconsequential. I always work under the assumption that the prospect has just asked, 'What's in it for me?' And as it turns out, he *has!* The salesman who can translate technical product features into vivid pictures of personal satisfaction is bound to sell."

One way to determine precisely what major benefits you have to offer is to do some homework. Examine your product, list the five major features which constitute its advantages or superiority over the competition and actually translate them into customer terms.

For example, if you are selling a "small" car, your five major features might read: 18 inches shorter than standard automobiles; 600 pounds lighter; sports car styling; 5'-wide seats; costs only $1800.

Translated into answers to, "What's in it for me?" those features might become these benefits: "maneuverable," "easy to park"; "saves money on gas"; "high trade-in value"; "seats six adults comfortably"; "small down payment."

R. P. Steiner, assistant general sales manager of General Cable Corp., suggests another approach. "Check back with satisfied customers and find out exactly how they are benefiting from your product. You'd be surprised how much an alert salesman can learn from the people who use his product."

"But," cautions the sales manager of an insurance firm, "not all the benefits of your product are of equal interest to different prospects. To one man, the most important thing in the world may be the knowledge that his child's college education is assured. To another, a guaranteed income at 65 may be of prime concern. A third may respond most enthusiastically to the idea of having his home paid for in case of emergency.

"Therefore, the salesman has to assess the prospect's

individual needs and pinpoint those which his product or service can most enticingly satisfy."

How?

By doing some reconnaissance along—

THE THREE ROADS TO A PROSPECT'S MOTIVES

Here are three of the easiest—and most often overlooked—methods of determining the "right" benefits to emphasize for a specific prospect:

1) Turn detective. A sales representative for an aluminum door manufacturer makes it his business, before calling on a prospect, to "case" his home. By the quality of the paint job, the appearance of the grounds, the kind of car parked in the driveway—even the magazines in the mailbox—he can make some pretty shrewd deductions about the prospect's wants and pre-choose the benefits most likely to satisfy them (*e.g.*, an unadorned lawn, an old car and a protruding copy of *Consumers Report* are tip-offs to emphasize practicality. A fancy rock garden amidst professional landscaping, a spanking new Cadillac and *Harper's Bazaar* dictate the "elegant" approach).

Other clues to a prospect's material—or psychic—needs:

Individual—job or profession, education, age, vocabulary, number and age of children, clothes, personal adornment, monogrammed possessions, hobbies.

Home—type of dwelling (ranch, split-level, colonial), d'cor, furniture (modern, early American, colonial), art objects, color and number of telephones, size of TV set, number of appliances.

Farm—location, size, appearance, degree of mechanization, number of employees, type of ownership (single, partners, corporation).

WHY PEOPLE BUY

Although different people are sold by different benefits, motivational research has uncovered four common denominators of desire. Appeal to any of these and almost certainly you will touch a responsive chord in your prospect:

▶ *Sustenance.* People buy the things they feel they must have to live—food, shelter, clothing. But we are all experts at rationalizing our desires. Given the slightest justification for considering a product *necessary*—we buy.

▶ *Sex.* Every man wants to be masculine; every woman wants to be feminine. If a product caters to this deep desire to appeal to the opposite sex, we are attracted to it.

▶ *Security.* A basic need is for safety and we tend to buy those things that may, by any stretch of the imagination, be counted on to ward off injury or misfortune.

▶ *Status.* The desire to feel important or powerful is built into almost everyone. If a product promises to raise our own—or our neighbors'—estimation of us, we are tempted to buy it.

2) Ask questions. "There's only one way to find out exactly what the customer wants in this business," says Martin Riskin, assistant banquet manager of the Waldorf-Astoria Hotel, "and that's to have him tell you. By asking him what kind of affair he has in mind—a business meeting, a strictly social gathering, a combination of the two—we can narrow down in our own minds the appeals that will most effectively sell him on using the Waldorf."

The side benefits of this approach are important, too. Questions are an agreeable form of flattery—you immediately make the prospect an "expert." By encouraging him to talk, you are in effect saying, "I'm interested in just one thing—satisfying your wants." And since most salesmen usually do the talking, your expressed desire to hear his side of the story will set you refreshingly apart from the competition.

3) Listen. Many salesmen overlook this obvious technique of pinpointing the prospect's needs. An old customer's complaints . . . a new prospect's objections . . . specific references to the competition . . . questions . . . "irrelevant" observations by a prospect—any of these, properly interpreted, can give you a clue to the all-important benefit your customer is seeking.

For example, an insurance agent who frequently runs into the objection, "Your premiums are too high," knows from experience that that's his cue to appeal to the prospect's desire to save money. "This policy *compels* you to create a nest egg," is his effective reply.

A fertilizer salesman has found that when a prospect sneers, "You couldn't fill my order that soon," he often means, "Prove to me that you *can*."

"Then I have my work cut out for me," the salesman explains. "The benefit I hammer away at is quick delivery, which happens to be a specialty of my firm."

Best of all, say the men who have trained themselves to do it—

SELLING BENEFITS WORKS WONDERS

It puts the timid, unsure salesman who fears being rejected into a confident, poised, positive frame of mind. He no longer sees himself as a seeker of favors, but rather as a conferrer of them.

No longer does he call on a prospect because he *has* to, but because he *wants* to. He doesn't *hope* to get an order; he's fired by the conviction that he *deserves* to get an order.

His thinking runs something like this:

"My product can help Mr. Smith save $1000 a year (or boost his profits, or increase production, or attract more customers, or cut down his overhead, or achieve financial security, or have a more beautiful home, or save time, or avoid accidents).

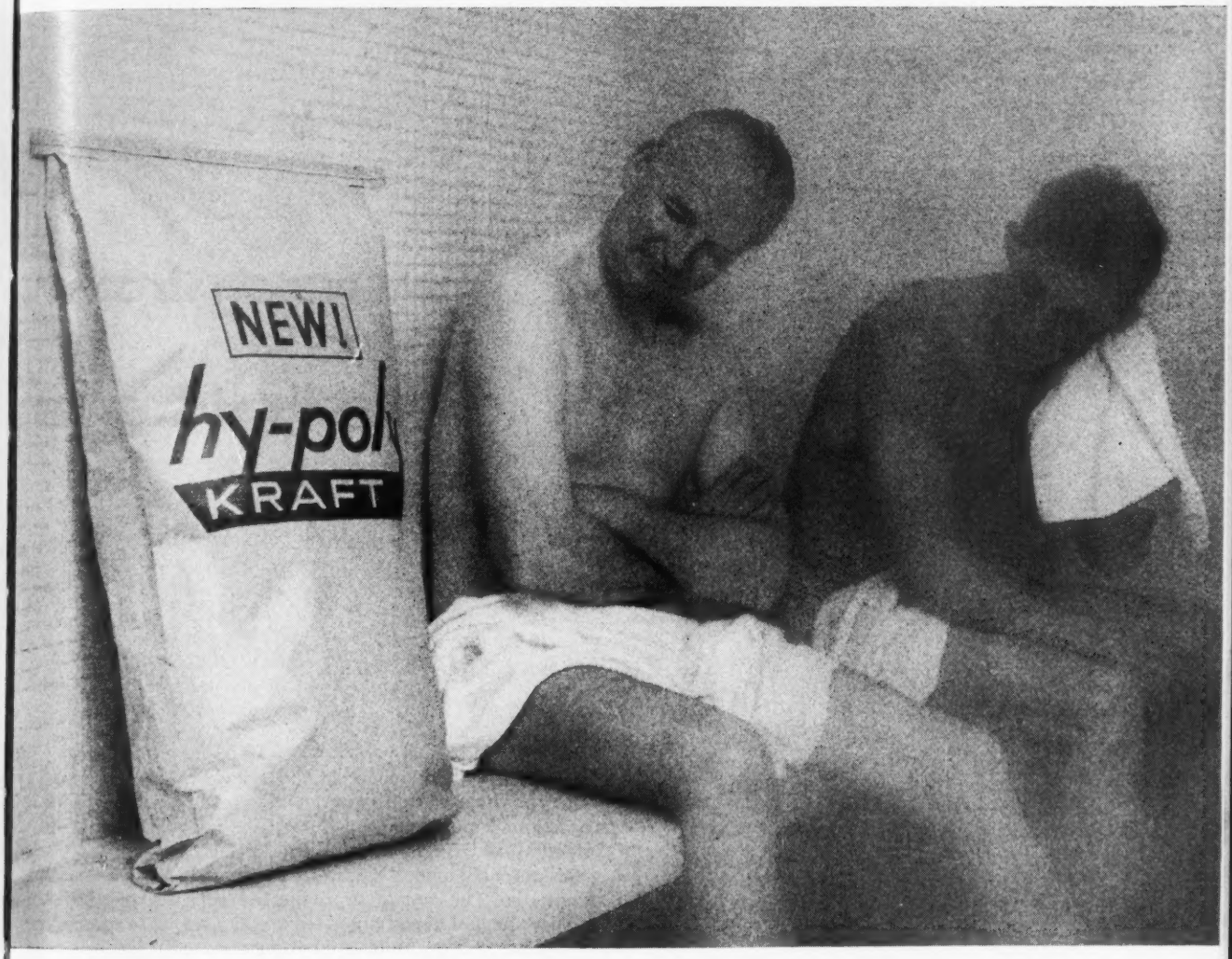
"This is something he doesn't yet know. Once he does, he is bound to be interested in my proposition. All I have to do is prove that the benefits I can deliver are worth more than the dollars they cost.

"They *are* worth more and I can prove it. When I do, Mr. Smith will be convinced—and buy."

Does the man who thinks like that sell more?

He does! ▲

Now International Paper saves you $5 to $16 per thousand PE multiwalls!



Read why new humidity-proof "Hy-poly" kraft makes medium and low-density polyethylene sheets extravagant!

THE multiwall bag you see taking a Turkish bath in our picture contains *calcium chloride*.

We steamed this new Bagpak® multiwall in 95% relative humidity at 120° F. for 48 hours. (Unprotected, under these conditions, this chemical takes on 2½ times its weight in water in about an hour!)

But when we opened up the bag, the thirsty crystals spilled out as though they had been stored on the Sahara!

And Bagpak's new Hy-poly kraft *saves you money*. You stand to save from $5 to $16 per thousand multiwalls!

That's because new Hy-poly kraft is so superior to medium and low-density PE sheets that you get equal, if not greater, moisture-vapor protection from a coating approximately *half as thick!*

Extensive laboratory tests prove that this dramatic new barrier sheet is superior in *every way*. Write us today for samples.

See how calcium chloride protected by Hy-poly kraft Bagpak, pours after 48-hour steam bath!

Bagpak Division INTERNATIONAL PAPER New York 17, N.Y.

COMING...

A marketing seminar for farm chemicals

By THE STAFF

On November 16-17 Fertilizer and Pesticide company representatives will meet with top marketing experts at the Barbizon-Plaza Hotel, New York City

THE PRODUCT manager of a large farm chemicals corporation provides a striking example of the consuming interest FARM CHEMICALS is evoking with its new *marketing* approach. In writing to this magazine recently about a certain series of articles on marketing, he not only requested reprints of the articles he had already read—*but also those yet to come.*

This is one example of how our new editorial approach seems to be hitting the jackpot with our readers. From the response received since January when the new editorial approach was adopted, it is evident that FARM CHEMICALS is developing as a center of *materia economica* for the industry. The publication has been making very serious editorial efforts to help management answer many of the marketing problems with which it is confronted.

But to be sure, for many management people there are distinct limitations to the *printed word.* In fact, since the inception of our marketing emphasis, many members of this industry have approached staff personnel with marketing problems specific in nature—*and not necessarily of general interest to the whole industry.* Consequently, some of this subject matter does not fall within the established editorial format.

THE ANSWER . . .

This leads us to the logical *second step* in our marketing program, which actually had not been planned for

ar for the

s industry

another year! This step will attempt to clear out some underbrush relating to certain specific company problems. In succeeding paragraphs it will be referred to as FCMS or . . .

. . . FARM CHEMICALS Marketing Seminar!

It will be designed for management men—the *idea men* who introduce and promote new products and must make certain that the large promotional expenditures they handle each year . . . *pay off!*

THE TIME AND PLACE . . .

The FCMS will be held November 16–17 at the Barbizon-Plaza Hotel, New York City.

Some of the nation's top marketing experts will cooperate with fertilizer and pesticide company representatives in airing marketing problems and suggesting corrective measures. The general areas of discussion will be:

First, the *meaning* of marketing. This topic will be covered from two angles: 1) what marketing can do in terms of profit insurance for an industry and 2) what steps must be taken by farm chemicals concerns interested in employing it.

Second, the rather lofty concept of marketing will be brought *closer to home* with presentations concerning market analysis, research, and sales planning. What avenues of approach to research data gathering are available to manufacturers! A definition of consumers' needs, delimitation of existing markets, and the various applications for research and analytical data to obtain maximum marketing efficiency.

Third, there will be a thorough discussion of how industry members can go about evaluating their *present problems*. Ideas will be integrated into the existing marketing programs of the pesticide and fertilizer companies represented at the FCMS.

Fourth, and possibly most important, each of the general areas of discussion mentioned above will be followed by a question and answer session. This will be the true objective of FCMS . . . a veritable "bartering" or exchanging of thoughts and ideas, with emphasis on being a constructive critic of present distribution methods.

MORE INFORMATION NEXT MONTH

FARM CHEMICALS' editorial approach to date has been a simple one: attempting in a concentrated way to show the value of marketing as a key to future growth and profits. There comes a time, however, when *for the good of the industry*, specialists should be called upon for analyses and consequent help.

The time is November 16–17! Complete details will be published next month. In the meantime, more advanced information may be obtained by writing this publication.

personnel appraisal

By F. E. HARTZLER

ARE SOME OF your employees doing too much, while others seem to be standing around? When you want something done—something special—does it seem that you always have to do it yourself? Have you recently added some departments or services that do not seem to be going as well as they should?

If you have either or all three of these problems, a personnel inventory or personnel appraisal form may be the solution—or at least provide the information to help you find the solution. This is a very useful step in business analysis. We can all see quite easily that a six-inch pipe cannot carry an eight-inch stream of water; we can also see that a big tractor can pull more than a small one; but it is infinitely more difficult to see the capacity or knowledge of our employees and the effect that this capacity, or lack of it, will have on our business.

These are the short term reasons for appraising personnel. The long term reason is that the information provided by this form will enable you to build the kind of business you want.

Now, with this in mind, let's see what goes into a personnel appraisal. First of all, you should make a list of all the duties that are performed around your place of business—*all of them*. This list will prove to be one of the most exhaustive chores you have tried for quite some time. In fact, you probably won't realize just how much real know-how goes into the operation of a business until you have made up such a list.

Just for the fun of it, let's start with the major duties in the money area. This is a list of only major duties and does not include the details and key points which would occur in a training program. In the money area, exclusive of bookkeeping, there is cash register operation, bank deposits, taking credit applications, granting credit, explaining terms, collecting procedures, and the utilization of stickers, collection letters phone calls, tracing skips, and personal calls. This list will, of course, vary by company, and in some

(*Continued on page 35*)

PERSONNEL ANALYSIS for _____ Business, January 1, 1959

JOB AREAS	Credit	Cash Register	Grant Credit	Application	Collection	Procedures	Deposits	General	Drive Truck	Scale Operator	Cleaning (Gen.)	Minor Repairs	Operate Elevator	Load Cars	Sales	Fertilizer	Apply	Recommend	Sell	Mix	Pesticides	Recommend	Sell
Manager		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓		✓	✓
John									✓	✓			✓					✓	✓			✓	✓
Pete									✓	✓	✓	✓	✓	✓			✓			✓			
Bill									✓	✓	✓			✓						✓			
Dick											✓		✓	✓									

READER SERVICE

FREE INFORMATION to help you solve fertilizer, pesticide problems

Chemicals

260—PENCO THIRAM TECHNICAL

Pennsalt Chemicals Technical Bulletin A-15 covers Penco Thiram Technical. Composition, general characteristics, screen analysis, packages and general uses are given. A carbamate type fungicide in powder form, the product is used for production of various formulations for seed treatment, foliage application and turf diseases. For your copy of the technical bulletin,

CIRCLE 260 ON SERVICE CARD

261—CCC-DILUENT

After thorough testing in the laboratory and field, a "new" improved CCC-Difuent is being introduced by Calcium Carbonate Co. V. S. Bond, the firm's technical director, says " 'fines' have been substantially reduced in the milling and classification process. As a result, drift is retarded, flowability increased, and toxicant exposure in finished dusts improved." A technical bulletin and data sheet on the diluent have just been printed and are available by

CIRCLING 261 ON SERVICE CARD

262—SEVIN ON FRUIT

Two new folders which describe use of Sevin insecticide on fruit are now available from Union Carbide Chemicals Co., Div. of Union Carbide Corp. One folder gives details about application of Sevin on apples, pears and peaches, and the other one covers grapes. Advantages, application rates and directions are included. If you'd like to have the two folders,

CIRCLE 262 ON SERVICE CARD

263—FRUIT SPRAY CHART

A convenient chart which outlines recommended procedures for the control of a number of deciduous fruit tree insect and mite pests has just been published by Stauffer Chemical Co. Major emphasis is on dosage recommendations of Trithion for delayed dormant, dormant and summer sprays and for post-harvest application to deciduous fruit. Crops include apples, crab apples, pears, cherries, plums, peaches and grapes. Copies are available without charge by

CIRCLING 263 ON SERVICE CARD

Process Equipment

264—FLOW METERS FOR PROCESS AUTOMATION

New electronic controls, registers and readout equipment provides liquid metering automation at operating pressures limited only by the process system, according to Bowser, Inc. Flow meter capacities range from 0.1 gpm to more than 40,000 gpm; and temperatures range from −445°F to +1500°F. The system utilizes a pipe-mounted, straight-through device known as the Pottermeter which contains an electric current-generating, turbine-drive rotor. Electrical output is directly proportional to the rate of flow, and accuracy is sustained at any velocity, according to the manufacturer. To obtain detailed information

CIRCLE 264 ON SERVICE CARD

265—CHEMICO BROCHURE

Descriptions of ammonia, hydrogen, methanol, nitric acid, sulfuric acid and urea processes and flow charts are included in a 16-page, two color brochure from Chemical Construction Corporation. Also included is a brief history of Chemico, and information on its engineering and construction organizations. Another section is devoted to gas scrubbers, both Venturi and Cyclonic types. You will receive a free copy, if you

CIRCLE 265 ON SERVICE CARD

266—"FLUIDICS" LITERATURE AVAILABLE

A new 16-page "Fluidics" Buyers' Guide will be of interest to all companies who handle or process liquids or gases, reports Pfaudler Permutit Inc. The bulletin explains Fluidics—the science of fluid processes—"as a new Pfaudler Permutit program providing a modern imaginative approach plus the specialized materials and equipment for handling and processing more profitably the liquid and gases used by industry." Specific areas covered include corrosion engineering, water treatment, ion exchange, reactions, distillation and evaporation, drying and blending, centrifuging, heat transfer, filling, storage, agitation, valving and piping, gas analysis and control, flow rate metering and control, waste treatment and project engineering. A copy can be obtained without charge by

CIRCLING 266 ON SERVICE CARD

267—DRY PROCESSING EQUIPT. CATALOG

An eight-page color catalog, illustrating and describing Sturtevant Mill Co.'s full line of dry processing equipment is now available. Included in the catalog is the Pulver-Mill, recently introduced to industry, plus information on air separators, blenders, mixers, crushing and milling machines, Micronizer fluid energy grinding mills, granulators, dens and excavators and other fertilizer industry equipment as well as laboratory units. To get your free copy

CIRCLE 267 ON SERVICE CARD

268—FERTILIZER PUMPS

Pumps for fertilizer and for temperature controlled liquids are covered in a new bulletin from Dean Hill Pump Co. In tests, the fertilizer pump has been running 18 months without shutdown in ammonia fertilizer applications, Dean Hill says. The pump for temperature controlled liquids, such as sulfur, incorporates a steam-jacketed line shaft and discharge column for continuous free flow. The free bulletin is available by

CIRCLING 268 ON SERVICE CARD

269—DUST COLLECTOR BOOK

A 24-page illustrated book titled, "Industry Relies on Dustlube Collectors for Efficient Dust and Fume Control" is being offered by Wheelabrator Corp. Operating principles of Dustlube collectors are illustrated and explained. Difficult "hot and corrosive" applications such as ventilation of electric steel furnaces, granular fertilizer dryers and chemical fume collection are discussed. A copy can be obtained by

CIRCLING 269 ON SERVICE CARD

Materials Handling

270—AUTOMATIC CHEMICAL NOZZLE

A stainless steel and aluminum automatic shut-off chemical nozzle is now available from OPW-Jordan. When drum, barrel or tank is full, the nozzle shuts off automatically, the manufacturer says. Capacity from 17–60 gpm, 1–1½ inch sizes. More information is available. Just

CIRCLE 270 ON SERVICE CARD

271—BUCKET ELEVATOR

A portable bucket elevator, said to be ideal for handling granular materials up to a 12′ height, has been announced by New London Engineering Co. The manufacturer says it has powerful electric motor drive, steel buckets bolted to belt, delivery chute, hopper and casters to suit each application. Details will be yours, by

CIRCLING 271 ON SERVICE CARD

how to use the READER SERVICE CARD

- *Circle number of literature you want*
- *Print or type your name, position, company and address*
- *Clip and mail the Service Card*

See pages 38, 50 and 51 for information on these Reader Service numbers:

285—Fairfield Concentrate
286—Sturtevant Pulver-Mill
287—H-50 Tractor Shovel
288—Simonsen Feedilizer
289—Hudson Handle Bag
290—Automatic Palletizer
291—Truck Dumper
292—Automatic Batching
293—White 4400TDs

272—WAREHOUSE LAYOUT

"Warehouse Layout: Narrow Aisles or Wide?" is discussed in an eight-page brochure published by Automatic Transportation Co. The history of the narrow aisle-wide aisle problem is discussed along with the changes and advances that have been made through the introduction of new materials handling equipment. There are four pages showing Automatic equipment in operation. Additional booklets are listed. Copies are available by

CIRCLING 272 ON SERVICE CARD

273—CHECKWEIGHING IN MOTION

A four-page folder from Toledo Scale illustrates and describes the features and advantages of the new Toledo Model 9460 Automatic Checkweigher. It points out that the checkweigher handles bags, boxes and other items while in motion, within a weight range of 50 lb. to 200 lb. Zone widths may be varied from about 2 to 8 ounces, with a zone edge accuracy of plus or minus ¼ ounce. Optional accessories described include automatic pilot lights and numerical counters. To obtain the folder,

CIRCLE 273 ON SERVICE CARD

274—PRE-BILT SECTIONAL BELT CONVEYOR BOOK

A practical handbook on the use and selection of its standardized Pre-Bilt sectional belt conveyors has just been released by Link-Belt Co. These conveyors, L-B reports, are adaptable to a large proportion of belt conveyor applications and operating conditions. Pre-Bilt conveyors are available in four belt widths of 18, 24, 30 and 36 inches. A total of 22 components and accessories are listed in the 40 page book, and also detailed engineering and selection data. Illustrations show installation applications in a variety of industries and typical layouts. A free copy can be had by

CIRCLING 274 ON SERVICE CARD

Packaging

275—STEPPED-END MULTIWALL BAGS

Ames Harris Neville Co. reports its new stepped-end multiwall shipping bags are made especially for fertilizers, chemicals, insecticides and building materials. The stepped-end is formed by staggering the various paper plies, then folding and gluing them to produce pliable, squared ends. Because the ends are squared, the user gets an extra "billboard" or identification space at each end of the bag, the manufacturer says. The new bags have a large valve, which tucks in after filling. For details, prices and delivery schedules,

CIRCLE 275 ON SERVICE CARD

Application Equipment

276—BULK FERTILIZATION BOOKLET AVAILABLE

"Your Land Is Different," a handy, 12 page booklet is available to spreader operators from Highway Equipment Co. It contains tips on soil testing, liming, proper fertilizer application and effective spreading patterns. For your copy

CIRCLE 276 ON SERVICE CARD

277—ANHYDROUS NH3 APPLICATORS

Pollard anhydrous ammonia applicators are the subject of a new bulletin from Pollard Manufacturing Co. Trailer applicators pictured and described are the "Custom Brute," "Nitrogen Prince" and "Pollard Junior". For tractor mounting, models include "Saddle Tank Mounted" "Three Point Hitch" and "Universal Hitch." For your copy of the bulletin,

CIRCLE 277 ON SERVICE CARD

278—NEW TYPE OF TEEJET NOZZLE

A new type of TeeJet Spray Nozzle has been introduced by Spraying Systems Co. permitting the fabricating of a spray boom from an angle-iron instead of piping. Nozzles are mounted in holes drilled in an angle-iron at desired intervals and the hose shanks are connected by hose to make up the complete boom. The complete nozzle consists of hose shank, nozzle body, cap and strainer body made of nylon, with strainer screen in stainless steel and orifice tips in either aluminum or stainless steel. Complete information on the nozzles is contained in a data sheet. Just

CIRCLE 278 ON SERVICE CARD

279—DELAVAN PLASTIC NOZZLE

Basic advantage of its new nylon nozzle for the agricultural sprayer industry, Delavan Manufacturing Co. reports, is its ability to withstand corrosive effects of farm chemicals, especially liquid fertilizer solutions. Nylon parts consist of nozzle cap, body and strainer. Tips can be furnished in brass, aluminum or stainless steel. Complete details are available. Just

CIRCLE 279 ON SERVICE CARD

Miscellaneous

280—PLASTIC CATALOG

Plastic sheets, rods, tubes, films, blocks and flat tubings stocked by Cadillac Plastic & Chemical Co. are listed in a 64 page catalog from that company. The catalog gives available sizes, weights, color ranges, textures, purchasing specifications, grades and prices, and includes a two-page comparison table of chemical, electrical and mechanical properties. To receive a copy

CIRCLE 280 ON SERVICE CARD

281—MOISTURE INHIBITOR

Harmful effects of moisture in electrical equipment are reportedly being eliminated by application of CRC Moisture Inhibitor. Corrosion Reaction Consultants, Inc., says the product eliminates the effect of wicking, reduces electrical failures and costly downtime. One application, by total immersion, by pouring, brushing or spraying, under most conditions will provide protection for at least a year, the firm claims. For complete technical data,

CIRCLE 281 ON SERVICE CARD

282—COLOR CHART OF PROTECTIVE COATINGS

Carboline Co.'s new color chart contains 21 color chips. In addition, chemical resistance of each pigmented color is shown in acid, alkali, oxidizing and weathering environment; and cost percentage higher or lower than standard gray and white is included. This, Carboline says, gives the prospective buyer a sound basis for choosing color schemes taking into account the relative chemical resistance and cost. The free chart is available by

CIRCLING 282 ON SERVICE CARD

283—NEW NEMA RERATED MOTORS

Lima Electric Motor Co. has announced a line of dripproof electric motors in new NEMA rerated frame sizes, from ½ hp at 900 rpm through 150 hp at 3600 rpm, frames 182 through 445 urs. The frames are rigid, seasoned, cast iron with integrally cast feet, and cast iron endbells have precision machined registers and bearing fits, Lima says. Connection boxes can be rotated to make connecting easier. Die cast aluminum rotors are equipped with dual cooling fans. Prelubricated sealed ball bearings require no cleaning, the manufacturer reports. The motors can be furnished either 3 or 2 phase and in all frequencies and commercial voltages below 600 V. For complete information,

CIRCLE 283 ON SERVICE CARD

284—CONVERSION FACTORS WALL CHART

A reference table for engineers and other executives in wall chart form has been published by Precision Equipment Co. Included are common conversions such as inches to centimeters or watts to hp, as well as many other conversions such as atmospheres to Kgs/sq. cm, cm/sec to miles/hr, cu. ft. to liters, microns to meters, quintal to lbs., etc. For your free wall chart,

CIRCLE 284 ON SERVICE CARD

PERSONNEL APPRAISAL

(*Continued from page 32*)

instances one person, the bookkeeper for instance, will be responsible for some or all of these duties. In other companies someone else will be responsible for them. However, the assignment of duties is not important here yet—that is in another area.

The problem we are dealing with here is securing a list of job duties which someone in the organization is supposed to do and that someone else is responsible for. Now once you have made up your list you are ready for the next step. (A sample form is included which shows you how such a list should be made. The personnel should be listed down the side of the page; job duties across the top of the page.

This chart, a personnel inventory, is a handy one once it is made up, because you can refer to it in making many decisions. It should be brought up to date at least once a year.

PERSONNEL DECISIONS

Let us see what effect a list of this kind can have on personnel decisions. The personnel decisions that this can influence are those dealing with hiring, firing, promoting, and training. These are most of the important decisions in personnel work.

From the sample form we can learn some vital facts about the business represented there and its employees. In the first place it is obvious that the plant is operated almost entirely by the manager. He can do everything.

Although this form is drawn up with fictional names and information for purpose of illustration, this still represents a very common situation in small business management. It is fine in one respect, but dangerous in another. The absence of one or more of the employees will not necessarily mean a tie-up, because the manager can step in and do the duties needed done.

On the other hand, one often finds the manager spending so much time doing chores that unskilled labor could do that he does not have time to manage the business effectively. The manager needs to protect himself by getting a more even spread of duties in this case. If you were to walk into a plant of this type, you would expect to see a very busy manager and find several employees hiding out in the elevator because they did not know what to do. This, incidentally, is the fault of the manager and not of the help. Yet the usual complaint of the manager is, "I have to do everything around this place myself," or "Help is worthless nowadays—never do anything."

Suppose you were going to hire a man for this business. After studying the personnel inventory, what skills does the business need? What skills are absolutely not needed? The manager certainly doesn't need more unskilled labor. He does need someone who can sell and possibly someone with a knowledge of credit and credit procedures. He may choose to review this form and his plans for the next year to determine which of his present employees could be promoted and trained in new duties. With the form he has a study at hand of the duties each man can do now. Let us take Pete for an example. If he should decide to make a salesman of him, he would have to train him in pesticide or fertilizer selling. Since he can apply, this might not take too much training, but he would have to spend some time on him in the pesticide area.

On the other hand he might feel that his problem lay in deciding which man to move up to number one man, John or Pete. What would be required in the way of a number one man? He would want him to handle credit, or at least be able to handle it when he, the manager, was absent. Which man would be most able to deal with customers? This is one place where the form can only hint, for it does not cover personality traits; but John has had more experience in dealing with people and should be a better man to handle credit.

PROMOTE FROM WITHIN

Here is an important point: try always to promote from within your organization. When you do hire, try to hire people who can come up from the bottom. You may not always be able to do this, but the form illustrated will do more to tell you what kinds of job skills you should be hiring than you will believe. This is an interesting and different way of looking at hiring. You are not hiring a man; you are hiring a group of job skills and abilities. If you want skills which are high and require training, you must be prepared to pay for them. If you want abilities that are not common, then again you must be prepared to pay for them.

Another decision area calling for personnel appraisal is that of giving raises. This, too, is simpler and more accurately handled with a personnel analysis form. The important thing to you is: how valuable is this man to me? If John comes in for a raise, you will be much more apt to grant it, all things being equal, than if Bill or Dick were to ask for one. From the form, we know that John cannot do as many things as Bill or Dick, but the things that he can do, none of the others can. John's skills are such that you need them, and if he is good in his job, you will give him a raise in order to keep him—you need the things that he can do.

Pete really has only one skill that the others do not have—the ability to apply fertilizer. He is in a little better bargaining position, depending upon the time of the year. But if he is an aggressive young man, you should be giving him more training in the skills that you need in your plan for business improvement during the coming years.

In summary, every plant should have a personnel analysis form—even if it has only three employees. It will enable you to balance the work that people do, and it will make a much better manager of you. Second, it is the only way that you can plan the expansion of your plant and be ready for changes with personnel who can do what needs to be done. Third, it is probably one of the fairest methods of appraising your personnel and granting promotions, as well as providing for training of those who can profit from such instruction and become more worthwhile to the firm. ▲

MATERIALS HANDLING
CUSTOM APPLICATION

PIPELINES *now move a variety of solids*

By PETER C. CROLIUS

Pictures from top:

Dragline dumps phosphate matrix into well or sump where it is sluiced with high-pressure streams of water to the suction of a large pump which starts the flow of the slurry through the pipeline to the washer.

Booster pumps are now used instead of relay wells when the length of pipelines is extended.

Slurry is discharged at top of the washer plant from the vertical section of pipeline at rear corner of structure.

PIPELINES, once considered for transportation of liquids and gases only, now are carrying solids.

According to one pipeline builder, if the material to be transported isn't alive, if it can be moved in sufficient quantities, and if it can be broken into lumps, pipelines may be the answer. Construction of solids-carrying lines has increased tremendously since 1950, but solids lines still amount to less than one per cent of the total estimated 600,000 miles of U. S. pipelines.

Biggest problem of solids pipe transportation lies in the suspending fluid. In order for the solid to be pipelined, the suspending fluid—usually water—must not change the characteristic properties of the material being transported and separation of fluid from solid must be done easily.

Most famous pipeline in this country is the "Big Inch," Texas to New Jersey petroleum carrier, built during World War II when German submarines threatened to strangle east coast marine transportation. Longest solids carrier was finished last year from Cadiz to Cleveland, Ohio. The 108-mile pipeline carries coal from mines to generators, cost $12 million, took nine years to build, and handles over 1.5 million tons of coal a year.

First in tonnages carried are the thirty-five solids pipelines which carry phosphate matrix—about 40,000,000 tons a year. Fifteen are in Florida.

Largest in the phosphate field, International Minerals and Chemical's solids lines have been in operation for about a year at Noralyn, Fla. Largest IMC carrier is an 18-inch tube which carries slurry from dragline to washer—up to five miles away. Slurry is composed of water, phosphate pebbles, and sand and clay in the phosphate ore. Solids average about 40 per cent of the slurry. Larger lumps of material may be six to nine inches in diameter. IMC's Noralyn pumping capacity is about 14,000 gallons per minute, 1750 cubic yards of material an hour.

IMC reports that slurry lines have a life of about 18 months during which pipe is used in three different positions by 120-degree rotations. Pipe removed from slurry lines is used for water recirculation to the strip mines. Booster pumps along the pipelines are now used in place of relay wells.

A *New York Times* report states that as of May, 1959, no pipelines are being constructed, but many are on the drawing board. Among commodities being considered for pipeline transport are wheat and wood chips from Canada to the Great Lakes.

According to the *Times*, the consulting engineering firm of Ford, Bacon, and Davis, largest pipeline builders ($1 billion worth) see the day when pipelines will be long and progressive chemical plants, mixing and processing in transit, delivering finished products to consumers from a number of geographically distant raw materials sites. ▲

IF YOU PACKAGE **FERTILIZER**

you can cut bag costs with **WONDERWALL**™

For example, 61 fertilizer companies show average savings of $5.75 per M bags by switching to the new, tougher WONDERWALL from their natural kraft bags.

Typical of these savings are those of one prominent fertilizer firm that had used a 15" x 5" x 35" four-ply sewn open mouth bag of 220# total basis weight. When they changed to a two-ply WONDERWALL of 180# total basis weight, they saved 40# in paper basis weight and cut their cost by $7.10 per M bags.

The comparable bag constructions were:

Old Natural Kraft Multiwall	
1/90 AL, 2/40, 1/50	220# Total Basis Weight
New WONDERWALL	
1/110 AL, 1/70	180# Total Basis Weight
Saving	40# Paper Basis Weight

Even though lighter, WONDERWALL resists breakage better because it's made with Kraftsman Clupak*, the extra-strong kraft with the built-in *stretch.*

See how WONDERWALL can cut *your* bag costs! Just write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, N. Y.

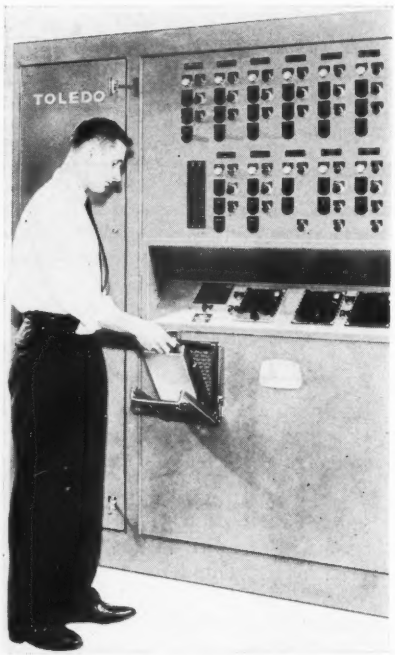
**Clupak, Inc.'s trademark for extensible paper, manufactured under its authority.*

West Virginia Pulp and Paper

◄AN AUTOMATIC PALLETIZER is being introduced by Miller Engineering Co. especially for bag stacking operations in two- and three-shift plants. "A Miller Automatic Palletizer will cost the user about $30,000," reports Frank H. Miller, Jr., president of the firm. "But in plants where from three to eight men are employed for bag stacking over a 24-hour period our palletizer will pay for itself in a surprisingly short time." The palletizer's operating parts consist of a motor-driven roller table, an elevator and an automatic ram. Each unit features either Westinghouse Cypak automatic magnetic control system or standard relay controls. For more information, circle 290 on service card.

materials handling IDEAS

◄THIS UNIT ELEVATES AND DUMPS contents of complete inplant truck into mixing equipment tanks, blenders, tumbling machines or other equipment. Manufactured by Conveyors and Dumpers, Inc., it is available in capacities up to 3,000 pounds and dumping heights to 50 feet. If you'd like details on the unit, just circle 291 on service card.



►AUTOMATIC BATCHING CONTROL method introduced by Toledo Scale is reported to eliminate the need for manual adjustment of individual weight selectors. Photo shows a "Batchboard" that may control as many as 20 ingredients being inserted into receptacle on Remocon control panel. The "Batchboard" contains a pre-set formula, and will provide accurate, automatic batching control of the desired amount of each ingredient in the formula, Toledo reports. More information is available by circling 292 on service card.

►FRANK W. EDMANDS CO. recently put these new White 4400TDs, equipped with hydraulic dump bodies, into service hauling about 20-ton loads of fertilizer and salt. The new diesels have 146-inch wheelbase and are equipped with NH195 engine, 10-speed transmission and White 134C rear axle with 4.63 ratio. Additional information on the 4400TDs can be had by circling 293 on the service card, between pages 32 and 33 in this issue.

THE ROSEBURG DISASTER

Although it was not the cause, fertilizer grade ammonium nitrate will undoubtedly suffer through tightened regulations

A ONE-IN-A-MILLION set of coincidences touched off the Roseburg, Ore., disaster on August 7, but fertilizer grade ammonium nitrate was not the cause as first reported by the press. Regardless of its innocence, however, fertilizer AN will undoubtedly suffer in the near future through guilt by association in tightened sets of regulations.

As near as can be determined, the facts are these: A truck containing 2½ tons of dynamite and 4 tons of blasting agent (ammonium nitrate *plus oil*) was parked near a warehouse in downtown Roseburg. The truckdriver was not in the vehicle at the time the warehouse caught fire. The fire touched off the contents of the truck. Over 20 people were killed or missing, many more injured, and property worth $10 million was destroyed or damaged in the resultant explosion.

Immediate newspaper accounts of the explosion and destruction carried such phrases as "the same highly explosive material that caused the Texas City, Tex., disaster" and "the fertilizer with the explosive nature." One account referred to the exploding material directly as "fertilizer grade ammonium nitrate."

QUICK ACTION BY ASSOCIATIONS

Because of quick action on the part of National Plant Food Institute and Manufacturing Chemists Association personnel, later news stories referred to the material simply as "a blasting agent" or "explosive chemicals."

Both NPFI and MCA sent messages to their members that early newspaper accounts were in error. MCA despatched a team of investigators to Roseburg within a day following the blast.

According to Pacific Powder Company of Tenino, Wash., consignor of the shipment, the blasting agent "Carprill" was on the truck. "Carprill" contains ammonium nitrate pre-mixed with oil. In this instance, the blasting agent was packed in 50-pound bags. The mixed and highly dangerous cargo was to be delivered to a road project east of Roseburg.

Most AN manufacturers recommend that the AN-plus-oil mixture be mixed at the use site rather than pre-mixed and shipped to the site.

The Interstate Commerce Commission is making a full investigation of the case and has indicated that the explosives-laden vehicle was subject to ICC jurisdiction. Title 49 of ICC regulations states that a truck loaded with explosive or other dangerous material shall neither be left unattended nor parked in any location so as to endanger life or property.

Among legislators to sound alarm were Congressman Charles O. Porter of Oregon's Fourth District and Senator Richard L. Neuberger also of Oregon. (Both lawmakers as well as Senator Wayne Morse asked President Eisenhower to declare Roseburg a disaster area. Governor Mark O. Hatfield, who flew from the governors conference in Puerto Rico to Roseburg, later declared that federal help was not necessary.)

"A NEED FOR A COMPLETE REVIEW"

"The first thing we have to find out is why this thing happened," said Rep. Porter. "Then, the chemical industry ought to do something to prevent further disasters from such causes." The Congressman suggested that one step might be the provision of two drivers for explosives-laden trucks.

Senator Neuberger sounded a more portentous warning: "This tragic explosion, on top of other recent incidents (probably referring to the Texas City disaster) shows a need for a complete review of safety regulations governing cargo movements of this type."

Although chemical groups are hesitant to say so, it is feared that reexamination of ordinances covering explosives shipments will soon start in many cities and ports. Fertilizer grade ammonium nitrate, although not an explosive in itself, will also come under scrutiny.

CONFUSION POINTED UP

Hearings on the "model law" finally hammered out last year in Baltimore, Md., regarding shipments of ammonium nitrate through the Maryland Port Authority, pointed up the confusion existing between fertilizer AN and AN as a blasting agent. The revised, now-in-force Baltimore port code still carries fertilizer grade ammonium nitrate on the books as a "dangerous material" although no mention is made of the word "explosive." (Representatives of both MCA and NPFI worked closely with regulatory groups in Baltimore to formulate the revised ordinance.)

It seems probable that similar confusion will exist as other localities, awakened by the Roseburg blast, attempt to revise their ordinances. ▲

NEWS OF THE INDUSTRY

SMITH-DOUGLASS-SMITH AG. CHEM. MERGER APPROVED

Stockholders of Smith-Douglass Co., Inc., in a special meeting at Norfolk, Va., voted August 7 to approve the proposed merger with Smith Agricultural Chemical Co.

Smith-Douglass has ten plants throughout the eastern half of the United States, while Smith Agricultural Chemical Co. has four plants in Michigan, Indiana and Ohio, with headquarters in Columbus.

IMC PURCHASES MIAMI FERTILIZER CO.

International Minerals & Chemical Corp. has announced purchase of the Miami Fertilizer Co. at Trebein, Ohio, near Dayton.

The Miami company is producer of "Big M" dry granular fertilizers, sold principally in the Miami Valley area of Ohio. Facilities include a fertilizer mixing plant and a granulating unit. Charles F. Martin will continue to manage the plant, with Clarence Crickmore in charge of production.

International Minerals has a total of 68 plants in the U. S., Canada and Mexico, 25 of them fertilizer plants.

SPENCER SALES & INCOME FOR FISCAL YEAR ANNOUNCED

Sales of Spencer Chemical Co. pushed to a new peak in the fiscal year ended June 30, totaling $57,584,334, compared with $45,148,936 in the previous fiscal year.

Net income for the year was $5,164,831, equal to $4.10 a common share, after preferred dividends, compared with $4,038,056, or $3.09 a share.

Kenneth A. Spencer, president, said that agricultural chemical sales contributed substantially to the record volume of more than 21 million dollars in the fourth quarter, reflecting an intensified sales program and favorable weather conditions with an extended period during which fertilizer was used.

MC LAUGHLIN TO MARKET PHILLIPS REPELLENTS

Phillips Petroleum Co. has announced a patent licensing agreement under which McLaughlin Gormley King Co., Minneapolis, Minn., will conduct sales development and marketing of five insect repellent chemicals discovered by Phillips research. The chemicals are said to be effective in repelling nuisance and disease-carrying insects affecting man and animals.

D.A. SALES & EARNINGS INCREASE FROM 1958

Diamond Alkali sales during the first six months of 1959 reached an all-time high of $65,922,622, an increase of 17 per cent over the like period of 1958. Earnings amounted to $5,201,563, up 118 per cent from the same period of 1958.

In the second quarter, sales reached $35,930,906. Earnings for this quarter were $3,075,662, equivalent to $1.10 a share, compared with $.55 a share for the similar period of last year.

PHILLIPS SIX-MONTH INCOME AND SALES REPORTED

Net earnings of $53,208,794, or $1.55 a share, in the first half of 1959 were 46 per cent higher than earnings of $36,411,576 or $1.06 a share in the same period of last year.

The Phillips board of directors reported that the higher 1959 profit from operations reflects a rise in petroleum products sales of 4 per cent along with increased sales of fertilizers, Philprene, synthetic rubber, plastics and other chemicals, and greater output of crude oil, natural gas and natural gas liquids.

CENTRAL FARMERS PLANT DEDICATION SET FOR SEPT.

Central Farmers Fertilizer Co. will dedicate its new $16 million plant Sept. 10, according to Robert Johnson, personnel director for the phosphate concern.

Avery L. Stutts, general manager of the Georgetown, Idaho, plant, has been in Chicago conferring with key directors and shareholders about the dedication program.

Ceremonies will be supplemented by a day-long schedule of activities, beginning with the arrival of a special train from Denver, carrying directors and shareholders from eastern cities to the plant.

FIRE STRIKES STAUFFER VERNON WAREHOUSE

The *Los Angeles Times* reported in July that fire destroyed 50 tons of sulfur and pulverized coal in a warehouse of Stauffer Chemical Co. in Vernon, Calif.

Thirteen fire department companies battled the blaze for more than three hours before bringing it under control, the report said.

SIX MONTH SALES, EARNINGS REPORTED BY HERCULES

Hercules Powder Co. reported for the six months ended June 30, 1959, net income equal to $1.36 a share of common stock. In the first six months of 1958, net income was equal to 89 cents a share of common stock.

For the second 1959 quarter, net income was equal to 79 cents a share of common stock. This compares with net income in the second quarter of 1958 equal to 51 cents a share.

Net sales and operating revenues for the six months' period were $137,200,312, against $116,773,028 for the corresponding 1958 period.

SOIL MIXER FOR NEMATODE CONTROL

A British scientist has designed a soil mixer machine which promises the cheapest control of nematodes and opens new possibilities for the control of other soil-borne pests, according to the British Information Services.

With one application of yellow mercuric oxide, the soil mixer can reduce the golden nematode population of a field by 60 to 80 per cent at a cost of $28 to $34 per acre, it is reported. In tests, potato yields have increased by 2¼ tons per

American Cyanamid Co. is underwriting its first outdoor advertising campaign for malathion, reports Outdoor Advertising, Inc. The campaign, according to the agency, Cunningham & Walsh, Inc., is specifically designed to reach cotton growers in 70 selected counties of Texas, Mississippi and Arkansas.

acre after soil has been treated with the new device.

Pesticide applications can be made to the surface at a depth of seven inches. After the seven-inch application, the machine thoroughly mixes the pesticide with the soil to a depth of nine inches.

CSC SIX-MONTH RESULTS

For the quarter ended June 30, 1959, Commercial Solvents Corp. announces consolidated net earnings of $701,632 equal to $.26 per share on 2,741,422 shares of common stock. Earnings for the same quarter of 1958 were $378,654, equal to $.14 a share. Sales for the quarter were $16,686,951, compared to $15,117,883 during the comparable period of 1958.

Consolidated net earnings for the six months ended June 30, 1959, were $1,367,312 equal to $.50 per share, against $735,925 and $.27 for the first half of 1958. Sales totaled $32,474,357, compared to $28,412,137 during the first six months of 1958.

AAC LETS CONTRACT FOR SULFURIC ACID PLANT

Leonard Construction Co. of Chicago has announced receiving the contract award for engineering and construction of a three-quarter-million dollar contact sulfuric acid plant at Cairo, Ohio, for The American Agricultural Chemical Co.

Completion of the plant is scheduled for March, 1960. The plant will use elemental sulfur as a raw material and will use Monsanto Chemical Co. vanadium sulfuric acid catalyst.

UNEXCELLED CHEMICAL ACQUIRES ASSETS OF AYLWARD CHEMICAL CO.

Acquisition of the net assets of Aylward Chemical Co. and its affiliates has been announced by Unexcelled Chemical Corp., New York City. It will be operated as the Aylco Division of Unexcelled Chemical.

Founded by Edwin C. Aylward, Aylco is reported to be the largest manufacturer of complete analysis liquid chemical fertilizers in the United States. Aylward will continue to direct the activities of the division.

FMC CREATES AD DEPT. FOR CHEMICAL DIVISIONS

Creation of a new Advertising and Publicity Dept. for Food Machinery and Chemical Corp.'s Chemical Divisions has been announced by J. V. Vernon, corporate vice president.

Named as manager of the department is Dr. Desmond M. C. Reilly, manager of advertising and technical information of FMC's Chemicals and Plastics Div. since 1957. Robert B. Rumely has been named assistant manager (publicity) and Don Hanson, assistant manager (advertising).

CORRALLING THE BUGS

Chlordane was used to control ants, mosquitoes and other insects on 400 acres of camp grounds used for the Girl Scout Senior Roundup near Colorado Springs, Colo., July 3–12. U. S. Air Force personnel sprayed the area shortly before the majority of the girls arrived. Velsicol Chemical Corp. said in releasing the picture, "News of this sort is a refreshing change from the adverse publicity that pesticides are receiving in so many national magazines . . . Public relations gestures of the type described can do a great deal to educate the public."

VC SALES CONTEST WINNERS GIVEN BERMUDA VACATION

Virginia-Carolina Chemical Corp. sent eight members of its fertilizer sales organization and their wives to Bermuda for an expense-paid week's vacation which started August 22.

The eight—four district managers and four salesmen—were winners in the company's "Showboat" sales contest started last January. Points were awarded for each ton of mixed fertilizer sold.

Winning managers: E. Exum Griffin, Estherville, Iowa; C. D. Griffin, Norfolk, Va.; P. E. Bradley, Memphis, Tenn.; and W. D. Barton, Montgomery, Ala.

Winning salesmen: Stanley K. Thomsen, Estherville; George M. Davis, Jr., Norfolk; Clyde Washburn, Jr., Memphis; and W. C. Edge, Birmingham, Ala.

O.M. 2nd QUARTER PROFITS UP MORE THAN 100%

Olin Mathieson Chemical Corp. reported July 27 that second quarter earnings this year were more than 100 per cent greater than in the corresponding 1958 period.

Net profits of the corporation for the first six months of 1959 were 79 per cent higher than in the first six months of 1958.

Domestic and Canadian sales in the second 1959 quarter of 1959 totaled $187,387,000, a 27 per cent increase over sales in the like 1958 period.

Net profits in the second quarter were $11,109,000 or $.84 per share. For the first six months of 1959, net profits were $17,504,000, or $1.32 per share.

SEVERE EXPLOSION AT HOOKER NEW YORK PLANT

A severe explosion in a chemical processing building at the Niagara Falls, N. Y., plant of Hooker Chemical Corp. on July 22 killed one employee and caused damage set at approximately $200,000 as a preliminary estimate.

Warehouse stocks of the chlorinated organic chemicals manufactured in the destroyed buildings were expected to be adequate to supply customers without interruption until the processes could be started up again elsewhere in the plant. Other processes were unaffected except that operations in the adjacent area were shut down temporarily as a safety precaution.

No one was in the building itself at the time of the explosion but two employees fairly near the building were treated for shock while the body of Edward M. Zaczek, 38, an electrician in the maintenance department, assigned to do some repair work in the building, was found about 30 feet from the building, having been hit by flying debris and burned by the fire after the explosion.

The last major explosion of this type in a Hooker plant occurred in 1948 at Niagara Falls when one man was killed and three were injured.

IMC'S EARNINGS UP 17% FOR YEAR ON 9% SALES GAIN

Record sales of $112,560,000 and a 17 per cent increase in net earnings were reported early in August by International Minerals & Chemical Corp. in audited figures for the fiscal year ended June 30, 1959.

Net earnings were $6,189,000 or $2.47 a share on the 2,349,427 common shares outstanding, compared with $5,273,000 or $2.09 per share on the 2,337,317 common shares outstanding for the 1957-58 fiscal year. Included in 1957-58 earnings was a non-recurring gain of 14 cents per share.

This year's sales record represented a 9 per cent gain over last year's total of $103,663,000.

T. M. Ware, IMC president, said that all divisions of the company operated profitably during the year.

DOW TO PAY STOCK DIVIDEND AND QUARTERLY DIVIDEND

The board of directors of The Dow Chemical Co. has declared a 2 per cent stock dividend—one share for each 50 held—in addition to a quarterly cash dividend of 30 cents per share on its common stock.

Both dividends are payable to stockholders of record at the close of business on Sept. 18. The cash dividend is payable on Oct. 15, 1959 and the stock dividend on Nov. 2, 1959.

FARM FERTILIZERS, INC. BUYS GENERAL FERT. CO.

R. E. Bennett, president of Farm Fertilizers, Inc., states that his company has purchased General Fertilizer Co. of Fremont, Nebraska, and will operate the firm as a wholly owned subsidiary of Farm Fertilizers.

The Fremont facilities can handle both bulk and bagged fertilizers.

AP&CC REPORTS EARNINGS, DECLARES DIVIDEND

Sales of American Potash & Chemical Corp. for the six months ended June 30, 1959, were $27,715,232, against $23,658,273 in the corresponding 1958 period, Peter Colefax, president, has announced.

Net income for the first half of 1959 was $2,539,748, as compared with $2,200,555 for the same period last year.

Directors declared a dividend of $.30 a share on common stock, payable Sept. 15 to stockholders of record Sept. 1, 1959. This represents an increase of 20 per cent from the previous quarterly rate of $.25 a share, which has been paid since Dec. 15, 1955. The board also declared quarterly dividends of $1.00 a share on the $4.00 cumulative preferred stock, Series A, and $1.25 a share on special preferred stock, both payable Sept. 15 to shareholders of record Sept. 1, 1959.

STAUFFER AND KALI-CHEMIE FORM JOINT VENTURE

Stauffer Chemical Co. and Kali-Chemie A.G. are concluding an agreement to form a joint company which will produce and market insoluble sulfur in Western Europe. The company, to be known as Kali-Chemie-Stauffer G.M.B.H., plans to build a plant at Hanover, Germany, and is expected to be in production by January, 1960. Output of the new facilities will be marketed under the Crystex tradename by Kali-Chemie A.G.

Kali-Chemie A.G. has 15 plants in Western Germany. It produces heavy chemicals, fertilizers, catalysts and pharmaceuticals.

A.C.L. BUYS FERTILIZER PLANT AT ORANGEVILLE, ONT.

M. J. Daignault, director and general manager of Agricultural Chemicals Limited, has announced the purchase of the factory and physical assets of Grand Valley Fertilizers Ltd. at Orangeville, Ont.

With this addition, A.C.L. now operates four fertilizer factories in Canada, located at Orangeville, Port Hope and London, Ont., and Fort Chambly, Que.

TEXAS GULF SULPHUR SALES AND EARNINGS

According to the semi-annual report of Texas Gulf Sulphur Co., net income for the first six months of 1959 was $6,969,975 or 69.6 cents per share, compared with $6,932,821 or 69.2 cents per share for the first half of 1958. Gross revenue from sales was $33,024,848 for the first half of 1959 as against $26,290,349 for the same period a year ago.

Net income for the second quarter of 1959 was $3,719,419 or 37 cents per share on the 10,020,000 shares in the hands of stockholders. This compares with earnings of

Calendar

Sept. 20-23. Canadian Agricultural Chemicals Assn. 7th Annual Meeting, Chateau Frontenac, Quebec City, Que.

Sept. 24-25. Annual Northeastern Fertilizer Conference, NPFI, Biltmore Hotel, New York City.

Sept. 25. Annual Crops Day, University of Arizona, Safford

Sept. 30-Oct. 1. Fourth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 13-14. Western Agricultural Chemicals Assn. Fall Meeting, Villa Hotel, San Mateo, Calif.

Oct. 14-16. Pacific Northwest Plant Food Assn. Annual Convention, Chinook Hotel, Yakima, Wash.

Oct. 15. National Plant Food Institute Conference on Chemical Control Problems, Shoreham Hotel, Washington, D. C.

Oct. 21-23. National Agricultural Chemicals Assn. 26th Annual Meeting, French Lick-Sheraton Hotel, French Lick, Ind.

Nov. 4-5. Fifth Annual Fertilizer Dealers Conference, Stillwater, Okla.

Nov. 4-6. Fertilizer Industry Round Table, Mayflower Hotel, Washington, D. C.

Nov. 5-6. Far West Fertilizer Safety Training School, Fresno, Calif.

Nov. 8-10. National Fertilizer Solutions Assn. Annual Convention, Statler Hilton Hotel, St. Louis, Mo.

Nov. 9-11. California Fertilizer Assn. Annual Convention, Fairmount Hotel, San Francisco, Calif.

Nov. 12-13. Southwest Fertilizer Safety Training School, Houston, Tex.

Nov. 16-17 Farm Chemicals Marketing Seminar, Barbizon-Plaza Hotel, New York City.

Nov. 16-20. National Aviation Trades Assn. Annual Convention, New Orleans, La.

Nov. 30-Dec. 4. 27th Exposition of Chemical Industries, New York Coliseum, New York City.

Dec. 7-10. North Central Weed Control Conference, Royal Alexandra Hotel, Winnipeg, Manitoba.

Jan. 6-8. Fourteenth Annual Northeastern Weed Control Conference, Hotel New Yorker, New York City.

Jan. 13-15. Agricultural Ammonia Institute Ninth Annual Convention, Statler Hilton Hotel, Dallas, Tex.

Jan. 14-16. Agricultural Aircraft Association Tenth Annual Convention, El Mirador Hotel, Palm Springs, Calif.

$3,460,334 or 35 cents per share for the second quarter of 1958. Gross revenue from sales for the second quarter of 1959 was $18,992,214 as against $14,152,171 for the second quarter of 1958.

MONTROSE CHEMICAL REPORTS RECORD EARNINGS

Montrose Chemical Co. has announced that preliminary earnings, subject to final audit, for the fiscal year ended May 31, 1959, reached an all time high of $920,000, equal to 97 cents per common share, compared with $749,000 or 79 cents per common share in the fiscal year ended May 31, 1958.

Associations Meetings

SOUTHWEST FERT. CONFERENCE ATTRACTS CLOSE TO 300

Nearly 300 industry representatives, experiment station personnel and fertilizer control officials registered for the annual Southwestern Fertilizer Conference and Grade Hearing at the Galvez Hotel, July 15–18.

Dr. Russell Coleman and R. L. Beacher outlined southwestern activities of the National Plant Food Institute, emphasizing the progress of intensified county soil fertility programs in Arkansas, Texas and Louisiana. Ralph Johnson, Georgia extension agronomy leader, reported on the Georgia fertilizer educational program results, and Dr. J. Q. Lynd, Oklahoma State University agronomist, presented a slide talk and film illustrating results of pasture fertility research in eastern Oklahoma.

Consumption trends and changes in recommended and approved grades and materials for the coming year were reported by fertilizer control officials from Arkansas, Louisiana, Oklahoma and Texas. Arkansas and Oklahoma officials reported total tonnage increases of about 22 to 24 per cent for 1958–59 over the previous year. Louisiana consumption for a nine-month period ending May 31, 1959 was up 14 per cent over last year. In Texas, consumption of mixed goods, through June, was about 4 per cent over the previous year, but abnormally low material sales in June brought total tonnage down about 1 per cent below the same period last year.

Arkansas and Louisiana removed 5–10–5 from their lists and adopted the 6–12–6 minimum for that ratio. Louisiana also dropped the 1–3–1 ratio.

Next year's conference was set for the Galvez Hotel, July 27–30.

EXPOSITION TO SHOW PROCESS ANALYSIS, CONTROL ADVANCES

New developments in continuous process analysis and control will be featured during the 27th Exposition of Chemical Industries, to be held at the New York Coliseum, Nov. 30 to Dec. 4.

Exhibits of new instruments and controls will form one segment of a display which includes the basic chemical materials and man-made structurals and intermediates.

Equipment for reducing, formulating and treating materials will be shown in many exhibits. Largest amount of space in the exposition will be occupied by displays of productive equipment.

Management of the exposition is being handled by International Exposition Co., New York City.

FRANCIS A. GUNTHER WINS AOAC AWARD

Francis A. Gunther, insect toxicologist of the University of California, Riverside, has been selected to receive the 1959 Harvey W. Wiley Award of the Association of Official Agricultural Chemists. The award of $500 is presented annually to the scientist who makes an outstanding contribution to the development of methods for the analysis of foods, drugs, cosmetics, feeds, fertilizers or pesticides, or for use in general analytical chemistry.

In notifying Dr. Gunther of his award, AOAC president, Dr. A. H. Robertson, stated: "The Award Committee has been most impressed by your success in developing practical analytical methods for pesticide residues on fruits and vegetables; the publication of *Analysis of Insecticides and Acaricides*, the only available book in the field; and your services to the profession of chemistry and to those charged with the responsibility of enforcing laws concerning pesticidal residues on food. . . . "

MONTANA PLANT FOOD ASSN. HOLDS SECOND CONVENTION

George Mason (left), Montana Plant Food Assn. president, and Warren Stensland (right) secretary-treasurer, discuss yield responses of native hay to fertilizer treatments with Bernie Brown, MSC extension soils specialist, and Harry Kittams, MSC ass't. soil scientist.

Members of the Montana Plant Food Association at their second annual summer convention last month heard about the latest soil and fertilizer research by a team from Montana State College.

Harry Kittams, assistant soil scientist at Montana State College, reported that fertility trials on native hay land produced economic yield responses in all but one location of the 13 experimental trials. He pointed out that wherever the phosphate supply of the soil was low, use of nitrogen and phosphate together resulted in greatest net profit per acre.

Murray Klages, assistant soil scientist at the college said that plans to move the soil testing lab from the chemistry department into the soils department were just about completed.

Other speakers from Montana State College included Dr. J. C. Hide, John Reuss and Bernard L. Brown.

F. Todd Tremblay, pacific northwest regional director of the National Plant Food Institute, spoke to the group about banker-dealer relationships.

PALM SPRINGS IS SITE FOR AG AIRCRAFT ASSN. MEETING

The tenth annual convention of the Agricultural Aircraft Association will be held January 14–16, 1960 at the El Mirador Hotel in Palm Springs, according to Wanda Branstetter, executive secretary.

"Safer and more scientific methods of protecting California's agricultural crop and forest lands through wider use of airplanes will

be the keynote of this annual meeting," said Mrs. Branstetter.

More than 400 representatives of the aviation, farm chemical and allied industries from all parts of the U. S. are expected to attend.

S. D. STATE OFFERS FOURTH AG PILOT COURSE

The fourth annual Midwest Agricultural Pilot Training course will be held at South Dakota State College, Brookings, S. D., October 19 to November 14.

Both flight instruction and ground school phases of the aerial application of agricultural products will be covered. The full course will include about 30 flight hours, part dual and part solo. Experienced applicator pilots may take an abbreviated flight course of 15 hours or less as required to check out in each maneuver. The flight training phase will be held Oct. 19 to Nov. 1.

Ground school phase of the course is scheduled for Nov. 2–14 and will include airplane care and service, calibration of equipment and pattern measurement, insect control and safe handling of chemicals, weed and brush control, seeding and fertilizing, plant disease control, laws and regulations and customer relations. Students may enroll for the classroom portion of the course without enrolling in the flight course.

A commercial pilot's license and experience in Piper and Aeronca aircraft are required for enrollment. Information may be obtained from Ralph Lindsay, air coordinator at South Dakota State College, Brookings, S. D.

NPFI SUPPORTS FOREST FERTILIZATION RESEARCH

A grant of $800 has been made by the National Plant Food Institute to the Southeastern Forest Experiment Station of the USDA for research on forest fertilization. The studies will be conducted on young loblolly pine trees growing in the Piedmont section of South Carolina. Specific objective is a determination of the best time of year to sample the foliage in order to best relate the nutrient status of the tree with the availability of nutrients in the soil.

AGENDA FOR CONFERENCE ON CHEMICAL CONTROL PROBLEMS

October 15 is the date for the National Plant Food Institute Conference on Chemical Control Problems, to be held at the Shoreham Hotel, Washington, D. C.

The conference will begin at 9:30 a.m. and adjourn at 4:00 p.m., with lunch from 12:00 noon to 1:30 p.m.

Topics and speakers include:

Introductory remarks by the chairman, Vincent Sauchelli, NPFI.

Statistical Methods for Chemical Analysts, W. J. Youden, National Bureau of Standards.

Magruder Check Sample Statistical Analysis: How to Use the Data, E. M. Glocker, W. R. Grace & Co. Research Center.

Panel Discussion: Tolerance Levels in Chemical Fertilizer Analysis, F. W. Quackenbush, state chemist and seed commissioner, Indiana; C. H. Perrin, research chemist, Canada Packers; H. J. Webb, research chemist, Clemson, S. C.; and A. J. Duncan, Johns Hopkins University.

Relation of the State Regulatory Office to the Local Fertilizer Industry, R. Z. Rollins, chief, Bureau of Chemistry, California State Dept. of Agriculture.

How Management Regards the Role of the Chemical Control Laboratory, Nelson White, vice president, International Minerals & Chemical Corp.

How Firm a Foundation, John Brabson, Chemical Development Div., TVA.

ROUND TABLE WILL DISCUSS PROCESSING PROBLEMS

Theme for the Fertilizer Industry Round Table, Nov. 4–6 at the Mayflower Hotel in Washington, D.C., is *Practical Problems in Processing Fertilizers.*

Featured will be a detailed description of two plant processes from raw materials to shipment. Two well-known, experienced operators will each tell about their layouts, process, mistakes to avoid, good features to accentuate and will be prepared to answer pertinent questions, according to Vincent Sauchelli, Round Table chairman.

Problems associated with the manufacture of conventional type fertilizers will have a place on the program this year, Dr. Sauchelli reports. Statistical quality control will be discussed by two noted statisticians. A symposium on preneutralization is scheduled.

California Fertilizer Conference

John H. Nelson, conference co-chairman and Millard E. McCollam, chairman of CFA's Soil Improvement Committee.

Dr. Daniel G. Aldrich, Jr., Dean of Agriculture, University of California; Howard H. Hawkins, president of the California Fertilizer Association; and Dr. Logan S. Carter, head, Soils Science Dept., Calif. State Polytechnic College.

Discussing fertilizer placement. Moderator, Dr. J. E. Knott, is at the podium. Panel members are Dr. Malcolm H. McVickar, Dr. John Lingle, Dr. Duane Mikkelsen, Dr. Oscar Lorenz and F. J. Hills.

Discussing tree fruit and vine nutrition. E. M. McCollam, moderator, is at the podium panel. Left to right are panel members Aldo D. Rizzi, Dr. Omund Lilleland, Dr. Carl Hansen, Dr. James Cook, and Vincent E. Petrucci.

L. S. HITCHNER FILES NAC STATMENT ON PESTICIDES-WILDLIFE RESEARCH WITH SENATE COMMITTEE

In a statement filed with the Senate Committee on Interstate and Foreign Commerce and the House Committee on Merchant Marine and Fisheries, on behalf of the National Agricultural Chemicals Association, L. S. Hitchner, NAC executive secretary, requested that any research programs pertaining to the effects of pesticides on wildlife be coordinated with other research programs on pesticide chemicals now being conducted by government agencies, state landgrant colleges, private research interests and with the pesticide chemicals industry who are also working on these problems.

Both the Senate and House Committees scheduled public hearings early in August on Senate Bill S. 1575 and counterpart House Bill H. R. 5813. The proposals request authorization to increase present annual appropriations of some $280,000 to over $2,500,000 for pesticide-wildlife research under the direction of the Fish and Wildlife Service of the U. S. Dept. of the Interior.

Hitchner advocated that "an advisory committee from the interested groups be created to coordinate their research programs for the best interests of agriculture, public health and wildlife," and that "economic factors should be a part of any such research studies."

Pointing out that a tremendous amount of information on pesticides is already available in some of the fields of study which the Fish and Wildlife Service indicated might be undertaken if increased appropriations are authorized, Hitchner gave as an example the toxicological data which must be developed by a manufacturer before registration and sale. He said, "Already we know much about the acute and chronic toxicity of the 280 chemicals on the market."

In conclusion, Hitchner suggested "that the U. S. Dept. of Agriculture and the U.S. Dept. of Health, Education and Welfare be given an opportunity to present information on research programs now being conducted in this field and to express their views on future programs to the extent that any programs which will be adopted will be of a constructive and cooperative nature and will be conducted in the public interest."

Attracts 200 People

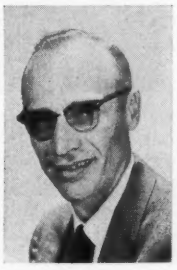
About 200 persons representing industry, commerical laboratories, universities, farmers, and others attended the June 29-30 conference at Davis, Calif. It was sponsored by the California Fertilizer Ass'n.'s Soil Improvement Committee.

People

Amchem Products, Inc. has promoted Dan W. Chisholm from southern district sales supervisor to manager of farm chemicals sales. Chisholm joined Amchem as a salesman in April 1952. He holds a B.S. in Agronomy from Texas Tech. and a Master's degree in the same subject from South Dakota State College.

Chisholm

American Agricultural Chemical Co. B. L. Emkes has been named manager of Agrico's Seymour, Ind., sales office. He had been assistant manager at Seymour.



Emkes

Gravitte

R. T. Gravitte, former assistant sales manager at Cincinnati, has been transferred to London, Ky., in the same capacity.

Changes in production personnel: W. C. Coale, Jr., becomes assistant superintendent at East St. Louis; W. M. Callahan, named superintendent at Three Rivers (Phoenix), N. Y.; and L. V. Gue becomes superintendent at Cincinnati, O.

American Cyanamid Co. Frederick E. McCormick has been appointed manager of commercial development for the firm's Agricultural Div. Previously manager of market research for the division, Mc-

McCormick

Cormick has been with Cyanamid since 1957.

American Potash Institute. Dr. R. E. Wagner, head of the Agronomy Dept. at the University of Maryland, joined API as director of its eastern region Sept. 1. He will serve the states from Virginia through Maine.

Wagner

Ashcraft-Wilkinson Co. Trenton R. Tunnell has been named president of Ashcraft-Wilkinson Co., according to an announcement by George W. McCarty, chairman of the board. Tunnell succeeds Van W. Wilkinson, who has been made vice-chairman of the board.

Tunnell

Formerly executive vice-president, Tunnell has spent his entire business career with Ashcraft-Wilkinson, joining the firm in 1920.

Eastman Chemical Products, Inc. has announced appointment of C. R. Lee to its Chemical Div. sales office in Skokie, Ill. Lee will represent the company in the selling of its industrial and specialty chemicals in the Metropolitan Chicago area.

Grace Chemical Div. of W. R. Grace & Co. has appointed P. Paul Lowery and Joe D. Leeke to its sales staff. Lowery has been assigned to the Memphis district sales office to represent the division in Texas, Oklahoma, Kansas and New Mexico. Leeke, also headquartered at Memphis, will travel in Tennessee, Kentucky, Missouri and southern Illinois.

Lowery

Leeke

Hess and Clark, Div. of Vick Chemical Co. Hermon A. High will become president of Hess and Clark on Sept. 15, succeeding Richard D. Waters, who has been named president of Vick Products Div.

Hooker Chemical Corp. H. William Kopp Jr. has been appointed works manager and Theodore T. Garrett named technical superintendent at the Columbia, Tenn., plant of the Phosphorus Div. of Hooker Chemical Corp. New Works manager of the Dallas, Tex., plant of the division is John W. Bunch.

Donald H. Kattman became manager of purchases for the Phosphorus Div. on Sept. 1. He is located at Jeffersonville, Ind.

International Minerals & Chemical Corp. Joseph J. Bozis has been appointed manager of customer service and Richard G. Powell manager of technical service for the Materials Dept. of the new Agricultural Chemicals Div.

Bozis

Powell

The Plant Food Div. has realigned its sales organization and production facilities in seven central and south-central states and reports the following personnel changes:

Cincinnati Area. James H. Sibley, district sales manager at Clarksville, Tenn., is promoted to district sales manager at Greeneville, Tenn., replacing Sam B. Broyles, who retires Oct. 1. E. Harold Harris, former sales representative at Clarksville, is named district sales manager there, replacing Sibley. Stanton D. Maple has been promoted to superintendent at the Clarksville plant, replacing J. H. Whitesides.

Atlanta, Ga., Area. Norton Futch is promoted to district sales manager at Americus, and W. P. Burke transferred to Tifton as sales manager of this new district. Malcolm W. James is promoted to plant superintendent, and J. H. Whitesides replaces T. M. Freeman, plant superintendent at Tifton, who retires after 38 years service.

Ke-Wash Fertilizer Co. announces addition of Robert Deeds to its management staff as production manager. He goes to the firm from Nichols Seed and Fertilizer Co.

Eli Lilly and Co. Agricultural Research Div. administrative personnel changes: Thomas M. Means, Ph.D., named head of agricultural research. Under Dr. Means, Edwin F. Alder, Ph.D has been made assistant head of plant science research, Robert N. Berkman, D.V.M., Ph.D, has been appointed assistant head of veterinary science research, and Frank O. Gossett, D.V.M., has been named assistant head of animal clinical research.

Wilson & Geo. Meyer & Co. Theodore I. Stone has been made vice president and treasurer. With the firm for 21 years, Stone has served as an accountant, senior accountant and treasurer.

Monsanto Chemical Co. Dr. John L. Payne Jr., a senoir research group leader with the Inorganic Chemicals Div., has been promoted to an assistant director of the division's Research Dept.

National Plant Food Institute. Louis H. Wilson, secretary and director of information, was elected to the board of directors of the American Association of Agricultural College Editors at its recent annual conference.

Charles W. Priddy & Co. George F. Reed, newly elected vice president, will be in charge of Norfolk Bag Co., a Priddy division. He expects to leave in mid-October for a six-week visit to Calcutta and

Pakistan, where he will study cultivation of the jute crop and manufacture of burlap.

The Quaker Oats Co. Chemical Div. Appointment of Norman C. Stephens as western district sales manager has been announced by Dr. Homer R. Duffey, vice president. Stephens joined the company as a technical sales representative in the Chicago office in 1949.

Stephens

Quebec Fertilizers Inc. Jean Leclerc, chief chemist of the Montreal soils laboratory of Canadian Industries Ltd. has been elected president of Quebec Fertilizers. Other officers elected at the recent annual conference of the organization were executive director—P.E. Bastien, Canada Packers Ltd.; secretary-treasurer—Lorrimer Whitworth, International Fertilizers; chairman, agronomic committee—Guy Gubbay, William Houde Ltd.; and chairman, advertising committee—Arthur O' Donoughue, Cyanamid of Canada Ltd.

Leclerc

Riverside Oil Mill. Keith B. Anderson, comptroller, has been elected secretary-treasurer of the Memphis Control of the Controllers Institute of America.

Shell Chemical Corp. Dr. C. C. Compton, manager of sales development for the Agricultural Chemicals Div., moves to Washington, D. C., to handle the division's activities in the Capital. He replaces Dr. M. J. Sloan, who becomes manager of sales development with offices in New York City.

Shell has reorganized its Union, N.J., technical service laboratory along product lines. Appointed under F. S. Swackhamer, laboratory director, as managers are E.S. Loeffler, agricultural chemicals, R. F. Buller, industrial chemicals, and C. M. Reider, plastics and resins. E. F. Eckman has been named manager of administrative services.

Spencer Chemical Co. Kenneth A. Spencer, president, has been elected chairman of the board and chief executive officer. He is succeeded as president by John C. Denton, former vice president in charge of the company's Agricultural Chemicals Div. Byron Kern becomes vice president of the Agricultural Chemicals Div. Since joining Spencer in 1946, Kern has served in a number of management positions, most recently as general sales manager, agricultural chemicals.

Spencer

Denton

Kern

Stauffer Chemical Co. Wilbur F. July has been placed in charge of advertising and promotion, Agricultural Chemicals Div. July went to Stauffer in 1955, and prior to his recent promotion was assistant to the agricultural chemical sales manager, Northeast area.

Union Carbide Chemicals Co., Div. of Union Carbide Corp. has appointed Eugene G. Ward to the Crag Agricultural Chemicals staff. Following a brief training period, he will join the field sales organization. As an entomologist, Ward will be active in sales of Union Carbide's new Sevin insecticide.

Ward

U. S. Industrial Chemicals Co., Div. of National Distillers and Chemical Corp. Edward C. Richardson and Jesse H. Hallowell have been named, respectively, Chicago and Boston sales division managers. Richardson, who holds a Bachelor of Chemistry degree from Cornell University, has been with USI since 1940, and was Boston Division sales manager since 1950. Hallowell was working as a salesman out of the company's Chicago office at the time of his new appointment.

Richardson

Hallowell

R. T. Vanderbilt Co. Russel J. Hahn goes to the firm as sales engineer, Specialties Dept. He will service accounts in the middle-Atlantic states, from Maryland north, all New England and the Province of Quebec.

Velsicol Chemical Corp. New men on the chlordane marketing staff are Edward Michael O'Leary and Philip M. Olson. O'Leary, who had been with Multi-Clean Co. will operate in the Midwest, with headquarters in Chicago. Olson, formerly with Southwest Potash Co., will be responsible for the eastern area, working from New York City.

O'Leary

Olson

Suckling

R. Paul Suckling has been appointed Canadian representative for Velsicol International Corp. His territory will include all of Canada, with headquarters in Montreal, Province of Quebec.

Virginia-Carolina Chemical Corp. Charles T. Harding, executive vice president, has been elected to the company's board of directors. This is his third major promotion at V-C in five months. At the same time, the board elected Dr. William P. Boyer vice president and Wallace T. McKeel treasurer.

Harding started with V-C in 1918 as a general handy man in a Washington, N. C., fertilizer plant.

Wisconsin Alumni Research Foundation has formed a new Information Office, with Joe Abrams as head. Abrams has served as information specialist with the Quartermaster Food and Container Institute for the Armed Forces and in both an editorial and management capacity in industry, specializing in pest control and commercial pesticides, WARF reports.

Government

USDA SENDS AGRICULTURAL OBSERVERS TO RUSSIA

USDA has announced the departure of an agricultural observation team for the Soviet Union under the U. S. Government's scientific and technical exchange agreement with the USSR. The group is the seventh agricultural team to go to the Soviet Union since the agreement became effective last year. Its purpose will be to gather technical information regarding biological control of pests.

Members of the team are L. F. Curl, Plant Pest Control Div., ARS, Washington; T. B. Davich, in charge of Texas Laboratory, Entomology Research Div., ARS; Herbert L. J. Haller, ARS, Washington; Halbert M. Harris, Iowa State University; Carl B. Huffaker, University of California; P. W. Oman, Entomology Research Div., ARS, Beltsville, Md.; and John B. Osmun, Purdue University.

Their travel takes them to Moscow, Leningrad, Kiev, Dnepropetrovsk, Krasnodar, Piatigorsk, Saratov, Baku, Tashkent, Alma Ata, and Omsk.

CENSUS OF AGRICULTURE TO BE CONDUCTED NEXT MONTH

In October and November, the 1959 Census of Agriculture will be conducted nationwide. Two weeks before the farm census begins, questionnaires will be mailed out to farmers by the Census Bureau. Reproduced below is the section of the questionnaire covering use of fertilizers and lime.

More than 30,000 census takers will visit all of the nation's 4 million plus farms to check the questionnaire forms and collect them.

Section XI.—FERTILIZER AND LIME — H

Include all fertilizer and lime used on this place *during 1959*, whether purchased by you or by your landlord.

271. On how many acres were **commercial fertilizer** and **fertilizing materials** used *in 1959?* . . . . . None ☐ Acres _____ —
(If "None," mark **X** *and skip to question* **[272]**.)

(Answer these questions, if "Yes.") →

Was fertilizer used *this year* on any of the following crops—	No	Yes	(1) On how many acres was fertilizer used?	How much was used— (2) Dry materials? (Include rock phosphate) Tons	Tenths	(3) Liquid materials? Tons	Tenths
(a) **Hay and cropland pasture?**	☐	☐	Acres		/10		/10
(b) **Other pasture** (not cropland)?	☐	☐			/10		/10
(c) **Corn?**	☐	☐			/10		/10
(d) **Soybeans?**	☐	☐			/10		/10
(e) **Irish potatoes?** . .	☐	☐			/10		/10
(f) **All other crops?** . .	☐	☐			/10		/10

[272] How many acres were **limed** *in 1959?* . . . . . None ☐ Acres _____ —
(If "None," mark **X** *and skip to question* **[274]**.)

273. How much **lime** or **liming materials** was used *in 1959?* . . . . . Tons _____ —
(Include ground limestone, hydrated and burnt lime, marl, oyster shells, etc. Omit lime used for sprays or sanitation.)

FUMIGATION TO PREVENT SPREAD OF FOREIGN TERMITE

A large wooden dry dock in the ship channel at Houston, Texas, was fumigated under supervision of USDA entomologists and insect control specialists to prevent spread of an extremely destructive species of termite. The treatment began Monday, July 20.

The termite (*Coptotermes crassus*) has not previously been found in this country but is known to infest western Mexico, Honduras and Guatemala. USDA scientists say the termite is "potentially an exceedingly important insect pest." Closely related species of the insect cause millions of dollars in damage annually in the Canal Zone, Hawaii, and Australia. Like termites in this country, the imported pest has an ability to establish and maintain colonies without contact with the soil in situations where water is available. For this reason the termites have survived without difficulty in the floating dry dock.

Surveys by a USDA pest control team indicate that the termite infestation is confined to the dry dock and a nearby pier. The insects represent a potential hazard, however, because they form wings during a stage of their life cycle and may fly to surrounding areas.

The elimination of this single infestation is important for two reasons, according to the USDA pest control specialists: The insect could cause tremendous damage to wooden structures and trees in this country. Failure to eradicate the pest now might result in the need for widespread control and eradication programs in the future.

The huge dry dock in which the termites have made their home has been towed to many ports of the World, including several in the Caribbean Sea. It is valued around $1.5 million.

Termite infestation was found by personnel of the ship-building firm in 1956.

Chemicals

NEW HERBICIDE FROM AMCHEM AND CHIPMAN

Tested by USDA and state experiment stations across the country, a new herbicide known as 4-(2, 4-DB) has now been officially approved for use on seed crops of alfalfa, peas, birdsfoot trefoil, alsike, ladino or red clover. The chemical will be sold as Butyrac 118 by Amchem Products, Inc., and as Butoxone by Chipman Chemical Co.

Major key to taking full advantage of the herbicide, the companies report, is early application. If weeds are treated when they are less than 1 inch tall, a quart is enough for an acre. If treatment is delayed until weeds are three inches tall, two quarts are needed. After this, tolerance of the weeds increases and treatment is no longer helpful. The crops named are resistant to 4-(2, 4-DB) even in the seedling stage.

Weeds controlled by the chemical include lambsquarters, pigweed, ragweed, kochia, stinkweed, nightshade and volunteer sweet clover. Until they are 3 inches tall, smartweed, Russian thistle, field bindweed, and curled dock also can be controlled with the new product, Amchem and Chipman said.

TATE CHALLENGES STATEMENTS ON MH-30

Recent statements that maleic hydrazide, MH-30, when used for sucker control, threatens the quality of burley tobacco are challenged strongly by Dr. H. Douglas Tate, manager of agricultural research for Naugatuck Chemical Div., United States Rubber Co., which manufactures the chemical.

"We can state with sincerity and conviction that MH-30, when used in accordance with latest recommendations, will produce burley tobacco that is equal in quality to that of hand-suckered tobacco and this tobacco will not differ significantly in taste or aroma," he said.

"Our conclusions," he continued, "are supported by more than 11 years of field evaluation and three years of extensive commercial use. . . ."

Dr. Tate added that Naugatuck is conducting an extensive educational campaign throughout burley producing areas aimed at teaching burley growers how to use the chemical correctly with maximum beneficial results.

EXPERIMENTAL HERBICIDE TESTED AGAINST WILD OATS

Agricultural authorities concerned with the wild oats problem gathered at Fargo, N.D., recently to view experimental test plots aimed at proving a new herbicide for the control of this major weed pest.

The herbicide involved in the experiments is Carbyne, a development of Spencer Chemical Co. Discovered in the company's biological research laboratories, Carbyne underwent a four-year period of greenhouse and limited field testing before the launching of a full-scale test program this summer. In the program, nearly 8,000 test plots in five locations in the U. S. and Canada are being evaluated.

According to P. W. Gull, manager of new product development for Spencer, "At the present time we believe that Carbyne shows promise in the control of wild oats in wheat, barley, sugar beets, and flax. However, no decisions will be made as to its commercialization until we are entirely sure that it is a practical and worthwhile herbicide." He indicated that these decisions would probably come sometime late this fall following complete analysis of this summer's testing program.

Greenhouse research has indicated that it controls wild oats by inhibiting its growth. In some cases, this growth inhibition is sufficient to kill the wild oat plant or, in others, it retards growth to the extent that the crop being grown will crowd it out.

NEW USES FOR PHALTAN

California Spray-Chemical Corp. reports that new uses have recently been registered for the fungicide Phaltan: On grapes-to-be-processed for control of Dead Arm, Black Rot, Downy Mildew and Powdery Mildew; on cranberries for control of several fruit rots and on sour cherries for post harvest foliage application to control Leaf Spot.

CAN OIL STOP FUNGI?

Scientists are puzzled by commercial banana growers' success in controlling Sigatoka leaf-spot disease of bananas by an unusual method—spraying with oil, USDA reports. Although oil sprays are widely used for insect control, this is the only plant disease now controlled in this way.

A curious fact is that oil apparently doesn't attack the fungus directly. In fact, scientists at the Federal Experiment Station, Mayaguez, Puerto Rico, found that the fungus grew well in oil culture and on oil-coated leaves. Oil inhibits the fungus only after it enters the leaf.

The tests were made with two petroleum spray oils similar to those used on various crops for insect control, as well as with a pharmaceutical mineral oil and a chemically inert silicone. Effectiveness of the latter suggests the oils act on a physical rather than a chemical basis. Exact mechanism of control, however, is not yet understood.

For control of the leaf-spot disease of bananas, the oil is applied in pure form as a mist at the rate of 1 to 3 gallons per acre.

The Puerto Rican researchers are now studying the possibility of controlling a variety of leaf diseases in the same way.

BEHAVIOR OF DDT IN WATER INFLUENCES EFFECTIVENESS

Discovery that the behavior of DDT in water influences its effectiveness in killing mosquito larvae was reported last month by USDA. The discovery may help explain some of the unpredictable results that mosquito control workers have obtained in applying the insecticide to ponds, lakes, and other mosquito-breeding areas. Field studies are being contemplated by the department to see if changing the manner of using DDT will lead to more effective results.

Employing a radioactive tracer in DDT, USDA's Agricultural Research Service scientists found that the chemical rushes to get out of suspension in water either by evaporation or by clinging to the walls and bottoms of containers.

The discovery was made by USDA entomologists and chemists

at Orlando, Fla., in their attempts to determine why simple mosquito-resistance tests in laboratories failed in some instances to provide reliable data.

By duplicating the tests with DDT tagged with radioactive carbon atoms, the scientists traced the movement of the insecticide in the water. They found that DDT was lost by evaporation concurrently with water, by codistillation. Further, they found that DDT is so hydrophobic that it tends to concentrate on the upper water surface and container wall and bottom surfaces.

Within two minutes after stirring in 1 part of DDT to every hundred million parts of water, as much as a third of the DDT had fled to the walls and bottoms of the containers whether made of paper, glass, or aluminum. Further, in 24 hours more than half the DDT, long known for its persistence and nonvolatility, had evaporated.

Similar tests with parathion, malathion, lindane and dieldrin did not show this action.

ALDRIN USE APPROVED FOR PRE-CONSTRUCTION TREATMENT

Aldrin is now in the fight against subterranean termites, according to Shell Chemical Corp. The insecticide has been listed by the Federal Housing Administration for preconstruction treatment to protect new homes against the wood-chewing pests.

SOIL INJECTION CONTROLS MITES ON APPLE TREES

Recent experiments show that mites on mature apple trees can be controlled by injecting systemic miticides into soil under trees with a device designed by a USDA entomologist.

Field trials conducted in two Indiana orchards by Merrill L. Cleveland of USDA's Agricultural Research Service, in cooperation with Purdue University, showed that soil injection of Thimet, an organic phosphorus compound, effectively reduces mite populations.

Cleveland developed an injector that operates from a conventional high-pressure orchard sprayer by attachment to spray hose in the same manner as a spray gun.

The injector consists of a 4-foot piece of ¾-inch pipe into which is placed a four-foot section of ¼-inch pipe. The two pipes are welded together, closed at one end, and that end shaped into a point through which a small hole is drilled to the inner pipe. Water forced through this hole allows the injector to move into the ground with little effort.

The outer pipe has several holes near the point through which the miticide solution is forced once the injector has been inserted about 3 feet into the ground. A "Y" valve on the hose permits the closing of one pipe and opening of the other.

FERTILIZER AFFECTS WATERMELONS

Tests at the Arkansas Experiment Station indicate that fertilization has a major effect on the number of marketable melons produced and a minor effect upon melon size.

Researchers found that a shortage of any of the major fertilizer elements tended to reduce sugar content of melons. When yields were not affected by fertilizer differences, sugar content was not affected. "Thus, providing adequate fertilizer for good yields assures good quality," the researchers say.

Sixty pounds of nitrogen an acre as 30 pounds under the row and 30 pounds side-dressed was adequate for good yields in the tests. For highest yields, the Arkansas researchers found it necessary to apply 60 pounds of phosphorus and 30 to 60 pounds of potassium an acre in addition to the nitrogen.

FRONTIER CHEMICAL DEVELOPS CLOROFUME

Frontier Chemical Co. has announced development of Clorofume liquid grain fumigant. The product is composed of three 100% active ingredients, and contains by volume 71.25 per cent chloroform, 23.75 per cent carbon bisulfide and 5 per cent ethylene dibromide.

According to M. E. Clark, Frontier's vice president—marketing, testing of the fumigant has demonstrated the following advantages: 1) high insect toxicity, 2) greater grain penetrating power, 3) savings of 20–30% per bushel of protected grain, 4) safe handling with no special equipment or extraordinary precautions, and 5) offers no health hazard to human life when used with reasonable care. Frontier said that the product is approved by USDA and FDA without restrictive use recommendations or residual tolerance limits.

CONCENTRATE COMBINATION FOR ROACH CONTROL

Development of a new insecticidal concentrate for roach control combining immediate killing power with long-lasting residual effect has been announced by Fairfield Chemicals, Food Machinery & Chemical Corp.

The new formulation employs Pyrenone, Fairfield's pyrethrins and piperonyl butoxide combination, and malathion. An outstanding characteristic of its concentrate, the company says, is the marked reduction of the inherent odor of malathion.

Additional information about Fairfield Residual Concentrate No. 1 can be obtained by

CIRCLING 285 ON SERVICE CARD

Equipment Supplies

PLANT MAINTENANCE VOLUME AVAILABLE

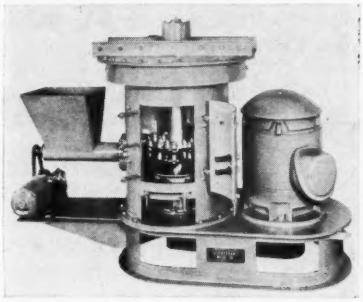
The tenth volume in the annual series, "Techniques of Plant Maintenance & Engineering," has been issued by Clapp & Poliak, Inc., 341 Madison Avenue, New York City 17. It is priced at $10 postpaid.

Bound in cloth-on-board and containing 266 pages, the book contains all papers read at the 1959 Plant Maintenance & Engineering Conference held in Cleveland last January.

STURTEVANT UNVEILS PULVER-MILL

A vertical hammer mill, with an integral air classifier for extremely fine grinding of soft, non-metallic materials in capacities of up to 5,000 lbs. of material an hour, has been introduced by Sturtevant Mill Co. It was designed for application in DDT, other chemical and process industries, Sturtevant states.

Called the Pulver-Mill, the unit offers double-hammer grinding and



deflector wall construction. As the revolving hammers crush material between stationary wall hammers, the deflector wall "bounces" insufficiently ground material back into the grinding zone.

For details,

CIRCLE 286 ON SERVICE CARD

HOUGH ANNOUNCES NEW H-50 TRACTOR SHOVEL

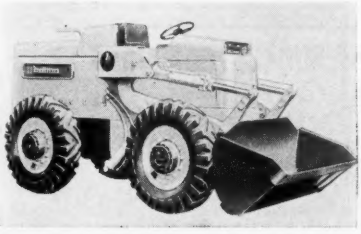
The Frank G. Hough Co. has just announced a new four-wheel drive, rubber-tired tractor shovel with 5,000 lbs. carry capacity, the Model H-50. Already in production, the loader will replace the Model HU Payloader.

Features of the new H-50, Hough says, include more power available for both hydraulics and traction, more efficient torque-converter, complete power-shift transmission, power-transfer differentials, power-steering, pry-out bucket action, safety boom arms, power-boosted brakes and numerous refinements. Gasoline and diesel engines provide from 90 to 92 hp.

To assure ample protection of the engine in dusty conditions, the H-50 has a large-capacity oil-bath air cleaner. A cartridge-type oil filter is built into the hydraulic reservoir. Similar filters protect the engine oil, and the transmission and torque-converter oil. Front service brakes are sealed.

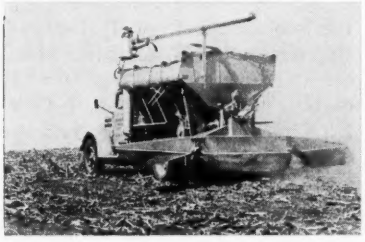
Literature and complete specifications on this new unit may be obtained by

CIRCLING 287 ON SERVICE CARD



SIMONSEN UNIT FOR FEED AND FERTILIZER

The first combination bulk feed and fertilizer body in the industry is the Feedilizer, reports Simonsen Manufacturing Co. The feedilizer is actually two complete bodies in one, with a total capacity of 261 cubic feet. Its two compartments will hold 8½ tons of fertilizer or 5.2 tons of feed. Also, one compartment can be filled with fertilizer and the other with feed.



Simonsen says the fertilizer spreader unit is designed to spread accurately down to 75 pounds per acre. Because its apron is run by a wheel drive, the truck can be operated in all gears or with a two-speed axle without affecting rate of fertilizer spread. Further information is available. Just

CIRCLE 288 ON SERVICE CARD

HUDSON MULTIWALL BAG FEATURES CARRYING HANDLE

Designed to lessen the load of carrying bulk packaged products in 25 lb., 40 lb. and 50 lb. multiwall bags are Hudson Pulp & Paper Corp's new bags with side carrying handles. Unique construction of the handles, the maker states, provides for a pull of up to 250 pounds.

The Hudson Handle Bag was developed primarily because of the sharp rise in retail bulk packaging to increase saleability of the product and to lessen the handling cost to retailers.

Literature is available, by

CIRCLING 289 ON SERVICE CARD

BULK FUMIGANT APPLICATOR REPLACES CYLINDERS

Ferguson Fumigants is introducing a new bulk fumigant applicator for application of their Dawson 37 (30% ethylene dibromide, 70% methyl bromide) fumigant mixture into grain bins, cereal processing plants and warehouses.

From the bulk tank on the applicator, which can be mounted on a small trailer or small truck, liquified gas passes through a meter that records directly in pounds the amount of fumigant applied. From the meter it passes into a valve header to which is attached a multiple of outlet valves connected to plastic tubing that is extended into the grain bin or building to be fumigated. At the end of the plastic tubes, and on the inside of the building, there is a nozzle with exchangeable orifices which have a known rate of flow, thereby giving the fumigator control over rate of application.

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Suppliers Briefs

Allis-Chalmers acquisition of Tractomotive Corp. was completed June 30, following approval by Tractomotive's board of directors. 2.25 shares of A-C common stock was exchanged for each share of Tractomotive.

V. M. Holloway has been named to the new position of general sales manager, Construction Machinery Div., for Allis-Chalmers.

John Bean Div., Food Machinery and Chemical Corp. has appointed John W. Edgemond, Jr., as manager of new products research.

Chase Bag Co. has appointed Thomas A. Eadon, Jr., sales manager of its New York Sales Dept. E. M. "Woody" Woodrich succeeds Eadon as sales manager in Philadelphia.

Eugene P. Alexander has been named sales manager of Chase's Paper Bag Div., with headquarters in New York. Alexander has been manager of the sales office in Chicago since 1957 and prior to that was sales manager. William J. Gosney succeeds Alexander as manager of the Chicago office.

Continental Can Co. Hazen P. Master becomes an assistant products sales manager for non-food cans in the Metal Div.

Dorr-Oliver. Lloyd R. Boling has been elected executive vice president. He will administer operating affairs of both the parent firm and subsidiaries. Vice President T. Bartow Ford has been assigned overall responsibility for activities involving design, engineering and sale of complete plants including FluoSolids installations.

Highway Equipment Co. Truck Equipment Co., Fort Smith, Ark., is new distributor for Highway in the state of Arkansas.

Dealers Truck Equipment Co., Inc., Shreveport, will distribute the company's spreaders and blenders in Louisiana, except for the eastern section, and P & R Truck Equipment Co., El Paso, Texas, is a new distributor in the El Paso area.

Kraft Bag Corp., subsidiary of Gilman Paper Co. A contract has been placed with S. S. Jacobs Co. who will erect a modern converting plant of about 300,000 sq. ft. in St.

Marys, Ga. The building will house the combined multiwall bag plants, grocery bag plants and other converting operations of Kraft Bag.

St. Regis Paper Co. has filed with the Securities and Exchange Commission a registration statement relative to the issuance of shares of St. Regis common stock to be offered in exchange for the 44,235 outstanding shares of common stock of Lone Star Bag & Bagging Co. of Houston, Tex.

Vulcan Steel Container Co. David W. Lynch has been named to the new position of sales manager-national accounts, according to an announcement by Gordon D. Zuck, president. Lynch will headquarter at the company's main offices in Birmingham.

Lynch

West Virginia Pulp and Paper Co. has named Shelton J. Jones staff assistant to Allan Woodruff, manager of the company's St. Louis, Mo., plant.

Western Precipitation Corp. Appointment of Ray Hermanson as advertising and market research manager has been announced.

Yale & Towne Mfg. Co. Masterson's Equipment, Inc., with sales and service center in Seattle and sales office in Tacoma, has been named franchise representative for Yale industrial lift trucks and tractor shovels in western and central Washington state.

Yale Materials Handling Div. appointments: J. J. Curry to midwest regional sales manager; Harry Hein to electric truck sales engineer; William Wire to assistant sales manager of Worksaver and Warehouser Sales; and Charles J. Riewe to field sales engineer in the Worksaver and Warehouser Sales Dept.

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PATENT REVIEWS

By Dr. Melvin Nord

New TVA Fertilizer Process

U. S. 2,879,153, issued March 24, 1959 to Francis T. Nielsson and assigned to Tennessee Valley Authority, describes a process for the manufacture of fertilizer from phosphate rock, nitric acid, ammonia, and potassium sulfate. The process is based on the discovery that if phosphate rock is extracted with nitric acid and ammonia and potassium sulfate are added, it is possible to add more than the stoichiometric amount of ammonia required to precipitate the P_2O_5 and fluorine in the slurry as dicalcium phosphate and calcium fluoride, without adversely affecting the solubility of the P_2O_5.

As shown in Fig. 1, phosphate rock and nitric acid are introduced continuously into the first of two extraction vessels *1* equipped with suitable agitators. Partially reacted slurry from the first vessel is overflowed to the second vessel, in which the reaction between rock and acid goes to completion. The completely reacted extract slurry is overflowed from the second vessel and is conducted to the first of four ammoniation vessels *2*, also equipped with agitators (not shown). Gaseous ammonia is introduced continuously into the slurry in each of the ammoniation vessels. The flow of ammonia preferably is adjusted so that about 50 percent is introduced in the first vessel, 30 percent in the second, 10 percent in the third, and 10 percent in the fourth. From 100 to 120 percent of the amount of ammonia stoichiometrically required to precipitate all the P_2O_5 and all the fluorine in the slurry as dicalcium phosphate and calcium fluoride, respectively, is added to the slurry in the ammoniation vessels.

Potassium sulfate is added continuously in the first ammoniation vessel. The quantity of potassium sulfate added at this point is that amount that will give a weight ratio of K_2O to P_2O_5 in the slurry of 0.2 to 0.55.

The slurry discharged from the fourth ammoniation vessel is transferred to drier *3*. Drier *3* is preferably a concurrent direct-fired rotary drier. The drying operation is carried out so that the material discharged from the drier contains from 4 to 8 percent moisture and is in a fluid condition.

The fluid material discharged from the drier is transferred to mixer *4*, wherein the remainder of the potassium sulfate required to eliminate calcium nitrate is mixed with the material. Mixer *4* may be a pug mill or the like and is provided with a steam jacket for keeping the material within the mixer hot enough to retain its fluid condition. Sufficient moisture remains in the material fed to the mixer so that the potassium sulfate added is dissolved and reacts with the calcium nitrate present to yield calcium sulfate and potassium nitrate.

Material discharged from mixer *4*, having a moisture content of 2 to 4 percent, is finally transferred to rotary granulator *5*. Within granulator *5* the material is cooled to solid form and is granulated. The product discharged from the granulator is in the form of granules and is ready for bagging.

PESTICIDES PATENTS

U. S. 2,875,124, issued Feb. 24, 1959 to Van R. Gaertner and Dexter B. Sharp, assigned to Monsanto Chemical Co., discloses the use as fungicides of hydrazones of a carbonylic dihydropyran. These compounds are especially useful as cereal plant rust eradicants.

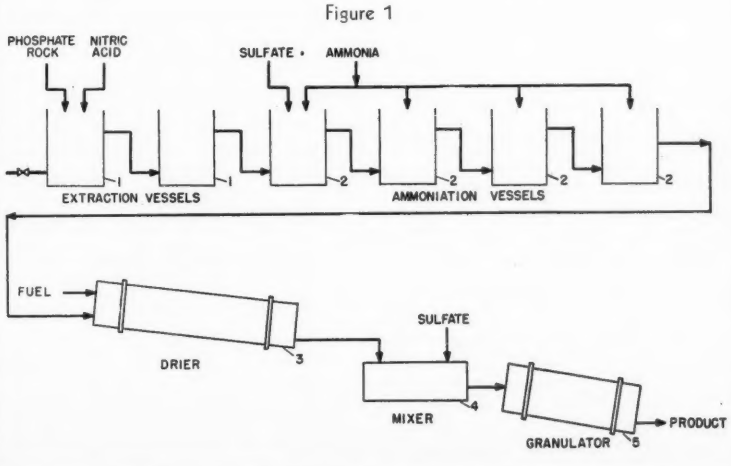
U. S. 2,875,125, issued Feb. 24, 1959 to Van R. Gaertner, assigned to Monsanto Chemical Co., discloses the use as fungicides of sulfamoylanilinoalkane sulfonic acid compounds.

U. S. 2,875,126, issued Feb. 24, 1959 to Ernst Hodel and Hans Gysin, assigned to J. R. Geigy A. G., discloses the use as fungicides of esters of 5-acyl-8-hydroxy quinolines.

U. S. 2,875,127, issued Feb. 24, 1959 to Eugene E. Kenaga, assigned to the Dow Chemical Co., discloses the use of sulfuryl fluoride as a fumigant for grain and its milled products, thereby controlling nematodes, bacteria, molds, and insects.

U. S. 2,877,152, issued March 10, 1959 to Joe R. Willard and John F. Henahan, assigned to Food Machinery and Chemical Corp., discloses a class of compounds having a broad scope of pesticidal activity, including insecticidal, fungicidal, acaricidal, ovicidal, and nematodicidal properties. The compounds are derivatives of methylene bisdithiophosphates.

Figure 1



PEST REPORTS

*By Kelvin Dorward**

Grasshopper populations were such that only localized areas required control measures during July. Damaging populations on croplands were reported from eastern and northeastern New Mexico counties where controls were applied to fields and fence rows in various areas.

The Federal-State-Rancher cooperative grasshopper control program in New Mexico accounted for a total of 275,000 acres of rangeland being treated. A severe grasshopper outbreak in July on rangeland in Golden Valley county, North Dakota, resulted in a cooperative control program on approximately 13,000 acres. A localized area with grasshopper populations up to 125 per square yard required control in Boise county, Idaho. Some damage from hoppers was reported from areas of Box Elder, Kane, and Washington counties, Utah. Controls were applied to 14,000 acres in Kane county.

A fungus reduced grasshopper populations in many areas of California below the economic level. In one area populations were less than one per square yard compared with more than five in 1958. Heavy populations in cropland were reported from several central and coastal counties of Texas but serious range populations failed to develop. In one area of Archuleta county, Colorado, ranchers and farmers organized a control program but in general grasshopper populations in the state were low. Populations in Montana were reported to be the lightest in the past five years.

The ***European corn borer,*** by late July, was causing more damage to sweet corn in central and southern Maryland than in 1958. Reports of field corn damage were received from Grayson, Loudoun, and Wythe counties, Virginia.

Second generation borer damage was not expected to be severe in Illinois, and the borer was the lightest in 10 years in Minnesota. The majority of the north central states reported rather light egg mass counts or feeding signs. It is of particular interest that considerable corn acreage in northern Alabama was treated for the European corn borer in June.

The ***corn leaf aphid*** was of concern in several areas during July. In the central Brazos River area of Texas the insect caused serious damage to young grain sorghums. Infestations of 10–85 per cent were in grain sorghums throughout Missouri. The insect could be found in all sorghum fields of several central Kansas counties. Indiana reported heavy populations on sorghum in Vermillion county and on corn in Tippecanoe county. Several barley fields were treated for the insect in Millard county, Utah.

The ***spotted alfalfa aphid*** continued to increase in central and southwestern Arizona alfalfa fields and to be a problem in southern New Mexico. Counts up to 1,000 per sweep were recorded in Alfalfa county, Oklahoma, and plant damage was evident. Heavy populations were observed in Etowah county, Alabama. These infestations constituted a new county record for the state. Populations up to very heavy were recorded in south central and southwestern Virginia with the higher counts being on older alfalfa.

Infestations of the ***potato leafhopper*** caused severe damage to alfalfa in north central Indiana. Yellowing of plants was also reported from Illinois and Missouri. Populations of the insect were heavy in some southeastern Virginia peanut fields, and controls were expected to be needed.

The ***rice water weevil*** was reported from rice and grasses near Biggs, Butte county, California, in early July. The infestation found represented the first record for the state and West Coast for this important rice pest. Surveys through the middle of July had revealed the pest to occur on rice and grasses in a 500 square mile area in portions of Butte, Glenn, and Yuba counties.

Mites were one of the principal fruit pests during July. These pests were on the increase in both Massachusetts and Delaware. Hot, dry temperatures were ideal for the buildup of mites in Indiana. Heavy populations in the Vincennes, Indiana area warranted control in both apple and peach orchards. The Orleans area of Indiana also reported heavy mite populations. Buildups were reported from South Carolina, New York, Michigan, Ohio and Minnesota. Bronzing of leaves occurred in Missouri and Kansas and considerable damage resulted to apples from mites in areas of New Mexico.

The buildup of ***codling moths*** was greater in the Cape Girardeau, Missouri, area than had been expected. In one orchard in Payne county, Oklahoma, "wormy apples" averaged 44 per cent, a 100 per cent increase over the infestation found in June. Codling moths were heavy in cherries in the Happy Camp area of Siskiyou county, California.

Among the vegetable insects causing damage during July were the ***Colorado potato beetle*** and ***flea beetles.*** The Colorado potato beetle caused damage in Jerome and Minidoka counties, Idaho. Complete defoliation of some plants was noted. The beetle was taken in Cache county, Utah, during July, apparently for the first time. In Maryland infestations of the insect were heavy in untreated fields.

Flea beetles were heavy on eggplant in Racine and Kenosha counties, Wisconsin, and killed potato plant tops in Allegany county, Maryland. Heavy populations were reported on horseradish in New Castle county, Delaware, and on potatoes near Corvallis, Oregon.

By the latter part of July ***cotton boll weevils*** were on the increase in certain areas while in others the insect was very light. Activity was on the increase in the upper Coastal Plain and Piedmont counties of North Carolina. In South Carolina treated fields carried low boll weevil populations, but the potential for higher infestations was developing with some fields showing square infestations up to

*Chief Staff Officer, Survey & Detection Operations, Plant Pest Control Div., Agricultural Research Service, USDA.

90 per cent. Boll weevil infestations increased generally over Alabama with infestations in the central area ranging up to 100 per cent. With the exception of areas in Texas, other reporting states had low weevil populations. A general increase was noted in central Texas as the second generation emerged.

Bollworms were damaging cotton and controls were necessary in the Imperial valley, Imperial county, California. There was a rapid buildup of the insect in southern New Mexico during the latter part of July. Controls were necessary. Activity of the bollworm increased in most areas of Texas with heavy egg deposition being reported. Activity also increased markedly in the delta counties of Mississippi and Madison parish, Louisiana.

An interesting early season note relative to forest pests pertains to ***spider mites.*** An outbreak of mites occurred on 10,000,000 acres of shortleaf and loblolly pine in southern Arkansas and northern Louisiana. Populations were estimated to average one million mites on each of many hundreds of thousands of trees. Heavy rains in late May and June reduced the infestation and new growth points to good recovery. Spider mites were heavier on evergreen nursery stock and ornamentals in northeastern Pennsylvania during July than in several years.

Elm leaf beetles were abundant and causing damage in some areas of New Jersey. Very heavy feeding on elms was noted in Sussex county, Delaware and complete defoliation occurred locally on Chinese elms in Wake county, North Carolina. General infestations of the beetle were present in Jerome county, Idaho, with damage heavy to elm trees.

A ***May beetle*** (*Phyllophaga bruneri*) was reported for the first time in the United States from Miami, Florida, in June. The insect caused considerable damage to various trees in north central Dade county. Further survey is underway and studies are being made to determine the potential economic importance of the beetle. ▲

TWO IMPORTANT ANNOUNCEMENTS TO ARMOUR'S FRIENDS IN THE FERTILIZER INDUSTRY

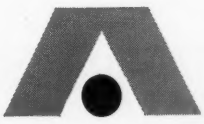
1. Armour has acquired and is now operating the Nitrogen plant of the Mississippi River Chemical Company at Crystal City, Missouri.

2. To better reflect our broadened scope of service, Armour Fertilizer Works is now known as ARMOUR AGRICULTURAL CHEMICAL COMPANY.

Now, more than ever, Armour is in a position to serve farmers and home owners with a complete line of fertilizers:

- Armour's complete line of farm fertilizers in recommended analyses including the famous COMMERCIAL VERTAGREEN.
- Armour's complete line of materials: 45% Triple Superphosphate, Phosphate Rock, Ammonium Nitrate, Nitrogen Solutions and Anhydrous Ammonia.
- Armour's complete Specialty Vertagreen Plant Food line for the lawn and garden trade.

While our name has changed, our tradition of friendly service and quality products remains the same.



ARMOUR FERTILIZER WORKS

ARMOUR AGRICULTURAL CHEMICAL COMPANY

ATLANTA, GEORGIA

Meeker Fertilizer Co.'s Pesticide Div.:

"Growth has be

Royal Tarter, assistant manager; Frank Meeker, owner; and Paul Willard, Pesticide Div. manager, read weed control book.

By HOMER HATHAWAY

"ABOUT 50% OF OUR volume is done in pesticides, herbicides and fungicides, and we've only been in that end of the business for seven years. The growth has been phenomenal, and we feel it will continue to grow."

Paul Willard, in charge of the pesticide division of Meeker Fertilizer Company, 520 Trade Street, Salem, Oregon, was talking, and what he had to say made sense.

"We went into the pesticide division of farm chemicals because it fell right into line with our fertilizer sales, and in three or four years it had built up to a goodly portion of the entire sales picture. We started in it mainly to fill the wants and needs of the farmers in the area.

"At the beginning we stocked just the materials which farmers came in and asked for, but as their needs and wants grew, we started an educational program, working with the cannery field men and through our dealers. Now we have some 40 different dust applications alone registered as our own, and we know that will increase."

The area which Meeker Fertilizer Company serves is just about as diversified as any formulator could possibly hope to find. Much of the soil is devoted to cannery crops, where one fourth of the entire pole bean crop of the United States is grown. Other crops include all the berry crops, sweet corn, nut crops, table beets, carrots, tree fruits. Also, a tremendous variety of seed crops, and small grains. Blue grass is grown in large quantities, with rust becoming more of a problem each year, mainly because much of this is virgin soil, with infestations becoming larger each year. Through intelligent application of fertilizers and pesticides, however, the problems are being met as they arise.

THREE NEW WAREHOUSES

The growth of the company has been so rapid that they have been forced to build three warehouses to handle the increase—at Stayton, Jefferson and Amity. They have not invested in dry application equipment, preferring to let the farmer either buy his own or have custom applicators do the job for him.

"We look at it this way," said Willard. "Farming is becoming more and more of a big business every year, with even the small operators having to invest heavily in machinery to stay abreast of the market. He must buy machinery for fertilizer and pesticide application, just the same as he has to buy a tractor, or any other piece of equipment, unless he has someone else do the job for him. We think it's best not to get involved in that end of the business, as far as dry applications are concerned. We devote our time and facilities to supplying our customers with the custom-formulated fertilizers and pesticides they need, and in keeping them informed of the latest developments in farm chemicals which can be beneficial to them on their own particular type of soil."

Keeping up with those latest developments is almost a full-time job in itself, according to Willard. The company works closely with Oregon State College and Washington State University, with research organizations. They help to conduct field trials with new insecticides.

"It's easy for any pesticide formulator to fall into a rut and stay with the same old formulas, forgetting that insects build up an immunity, just as viruses build up immunity against antibiotics given to humans. We may be somewhat unique in the field in that we also own a large farm where we can test our own formulations and new materials brought to us, which actually makes us a consumer as well as a seller."

EXCHANGING IDEAS, KNOWLEDGE

Paul Willard spends a great deal of time in meetings where ideas and knowledge are exchanged, and all to the advantage of Meeker's customers. Farmers are also encouraged to take short courses at the state colleges which will be of direct benefit to them in their operations. Among these meetings is one held every month by the cannery fieldmen's organization, and he also works closely with the colleges, the supply companies, the county agents.

"One of the most stabilizing influences in the entire farm chemicals industry in this area has been the formation of the Oregon Agricultural Chemicals Coordinating Committee. It is composed of representatives of industry, processor field men, county agents, experiment station workers, and others interested in the farm chemical field. There is still some cut-throat competition to be found in the area, but there would undoubtedly be more if the Council did not exist. We get together and really go at it hammer and tongs, and out of these meetings come recommendations as to the 'top' brands, as well as much other information. (See special report, page 59—ED.)

"Another thing which has evolved from this Committee is the publication of various Handbooks each

as been phenomenal . . .

and we feel it will continue to grow." That's what Paul Willard, manager of the seven-year old division told FARM CHEMICALS. Here is their story.

year which cover the entire field of insect control down to the very latest available information, with charts showing the kind of insect, what methods are best used to control it, and recommendations as to how much insecticide, herbicide or fungicide to be used on each acre and each crop. These books are distributed through the Coop Book Store at Oregon State College. I wouldn't be without each copy as it is released!"

ENTRY INTO LIQUIDS BUSINESS

Meeker is just getting started into the liquid fertilizer field, again because a need has developed. They specialize in custom-mixed fertilizers, and will continue to custom-mix in liquid. They will also devote a great deal of their attention to mixing fertilizers and pesticides for application in the same operation, since with the liquid fertilizers they are buying their own application equipment.

They hit their peak operation from March through July, and again in September-November, but they continue to carry all of their key personnel the year-round.

"We pay our help well, and try to keep them busy all year. A man is no good to us who has to take other work in order to make a living."

Frank Meeker, owner of the organization, has been in the fertilizer business for 27 years, but he feels exactly as does Paul Willard, when Paul says:

"No one can keep up in this business entirely by himself. He must have the assistance of others, and he must try to absorb the knowledge which the field has to offer. It would be better for the entire industry if more formulators would realize this, and quit trying to fight the battle by themselves.

"The farmer is going to college, he's getting smarter, and he knows that he must have higher production at lower cost, and the economic gains of using fertilizers and pesticides must be shown in concrete terms to the farmer. That is not difficult to do.

AN "EXCELLENT PROSPECT"

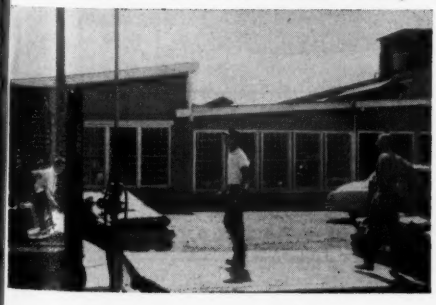
"For instance, a farmer in this area may see an occasional beetle in his bean crop, and give little thought to it, because he doesn't see a horde of them at work. But when his crop comes into the cannery, and is largely classified as culls, then he becomes an excellent prospect for pesticides.

"But this is the hard way for a farmer to learn. The pesticide formulator who has his customer's welfare at heart won't allow this to happen—he'll be in there preventing it, because an embittered farmer, even though he knows he should have used pesticides, may ask the $64 question—Why didn't you tell me what I needed? The farmer knows he must use better judgement next time or face the same discouraging result, and the fault is undoubtedly his. But as your customer, much of the blame will automatically fall on you, even though you may have tried (but not hard enough) to convince him that the use of pesticides would have avoided all the trouble in the first place."

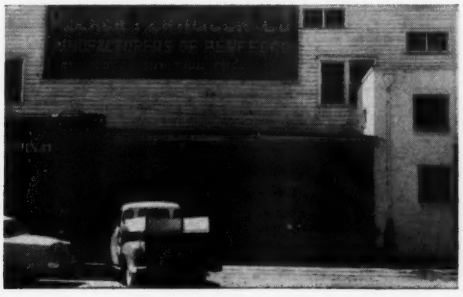
Paul Willard, like so many of the younger men in the industry, is fully aware that mistakes have been made, and are being made but he also knows that only by "trial-and-error" is anything accomplished, even though the price of accomplishment sometimes comes high.

But he would rather face a future where he knows that problems are being met head-on than sit back and wait until they have grown to the place where farm chemicals can be of no value, nor can anything else. This is the day of the "hard sell," and the formulator who thinks that business still has to come to him is definitely on his way out of the picture. ▲

Truck loading facilities shown below are located at the rear of the building.



Exterior view of the Meeker plant shows rail facilities.



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Oregon Agricultural Chemicals Coordinating Committee forms to:

COORDINATE *information on new farm chemical developments,*

EVALUATE *hazards and good local agricultural practices, and*

DISSEMINATE *the information it considers useful.*

By HOMER HATHAWAY

WHEN the Horticultural Society of Oregon met in December, 1956, there was much discussion about the formation of an Oregon Agricultural Chemicals Council. An informal meeting held at that time was attended by Roy Miller, Clark Amen, R. G. Rosenthal, W. J. Zeigler and R. W. Every. In their discussion, they arrived at the conclusion that the formation of such a council, to be composed of representatives of industry, processor field men, county agents, experiment station workers, and others interested would be desirable.

They also decided that the group should include representatives of the Agricultural Experiment Station concerned with the use of insecticides, fungicides and herbicides, as well as representatives of the State Department of Agriculture and State Board of Health.

The original purpose was defined as follows:

1) To coordinate information on new developments in farm chemical materials.

2) To evaluate hazards involved in the use of new materials and precautions necessary.

3) To disseminate findings and conclusions among trade and professional agricultural personnel.

A meeting was held with J. W. Scheel, Assistant Director of Extension, Oregon State College, and the proposal laid before him. He expressed definite approval of the plan and agreed to call a meeting of department heads who might be interested. It was agreed at this time that if such a meeting produced favorable reaction, the matter would be discussed at the annual meeting of the Northwest Spray Conference in January, 1957.

Favorable reaction was definitely lacking. The only real enthusiasm shown came from the Entomology Department. Several department heads felt they were already doing much of the work proposed, and were opposed to what they felt would be duplication. Others were somewhat agreeable, but could not see where they would fit into such a program.

In spite of this negative reaction, the promoters decided to go ahead, in the hope that those who opposed it would join in the program once it had demonstrated its effectiveness. A meeting with representatives of various chemical companies followed. The result of this meeting was agreement that the idea of a chemical council was a good one and that it could serve a useful purpose.

OFFICERS NAMED

Roy Miller, Miller Products Company, was named chairman of the group, with R. W. Every as secretary. Other members chosen to act as committee representatives included Lee Sturges, Clark Amen, C. R. Tanner, Paul Willard, and Dan Young.

Out of the meetings of this group came the recommendations for a handbook, since it became obvious if the committee was to function properly it would have to get its recommendations down in writing. Also, it was decided to rename the group, to be called the Agricultural Chemicals Coordinating Committee. At that time the general purpose was again reoutlined:

1) Co-ordinate information on new developments in agricultural chemicals.

2) Evaluate hazards including safety precautions, compatability, phytotoxicity.

3) To evaluate what constitutes good agricultural practices under varying local conditions as a guide in a) establishing time intervals between safe applications of pesticides in harvest under existing pesticide tolerances, b) collecting future residue data on pesticides.

4) Disseminate such information as the committee considered useful.

HANDBOOK ISSUED

As a result of this meeting and the advice of the committee the 1957 Oregon County Agents Insect Control Handbook was issued. It was distributed free to all county extension agents and went on sale at the Coop Book Store, where approximately 200 copies were sold.

Another meeting in 1958 produced another such book, with the name changed to Oregon Insect Control Handbook, with additional information on hop insect control added, along with additional data on all other pest controls secured and evaluated by the committee during the previous year. This book has sold 332 copies to date.

The formation of this committee, which started as just a hint of an idea, has brought a stability and cooperation to the farm chemicals industry which is much needed, as well as providing a dissemination of information in a concrete package which no one pesticide formulator could possibly secure by himself. It sets an example for the industry which should be seriously studied by any section which lacks such an organization ▲

TECHNICAL REVIEW

How did insecticides perform in tests at the Rothamsted Experimental Station, Herpenden, Herts, England?

Following are reports of research from that world renowned institution's "Report for 1958". Copies are available by writing to the Station Librarian.

Wheat-bulb-fly (Leptohylemyia coarctata Fall.) control. (*Box experiment.*) Insecticides tested as seed dressings included "Disyston", phenyl mercury monofluoro acetate and its ammonium carbonate complex, "Phosdrin", "Rogor" and "Thiodan". "Thiodan" was the only material to show any promise, but was not obviously superior to dieldrin and heptachlor, which are being used in the field experiments.

(*Field experiments.*) Experiments at Newborough near Peterborough and Southwick, Northants, in collaboration with Dr. H. C. Gough and his colleagues of the National Agricultural Advisory Service, tested the effect of seed dressings applied at two to twelve times the conventional dosage rate. The insecticides used were aldrin, dieldrin and heptachlor applied in an aqueous solution of methyl-cellulose to bind the toxic material to the seed. At Newborough, where there was a heavy wheat-bulb-fly attack, all three insecticides greatly increased yield, from 11·5 cwt./acre for the untreated to 25·2–27·6 cwt./acre for the treated. Heptachlor appeared slightly better than aldrin and dieldrin, and the dressings at the rate of 1 per cent insecticide to weight of seed were only a little better than the 0·15 per cent rate. The seed treatments were superior to combine-drill treatments with aldrin and dieldrin at 1·5 lb./acre, which gave yields of 19·7 and 17·0 cwt./acre respectively.

Results at Southwick, where the attack was less severe, were comparable. This trial included a standard seed dressing with 40 per cent γ-BHC at 2 oz./bushel of seed. This proved inferior to the other dressings, perhaps because the early November sowing is less favorable to BHC than the other chlorinated hydrocarbons. None of the seed dressings were phytotoxic. (Bardner.)

Bean aphid (Aphis fabae Scop.) control. *Effect of plant density of spring-sown beans on infestation and control.* The effect of plant density of sprayed and unsprayed crops on yield of spring beans was studied. Beans were sown on March 18, 1958 in rows 22 inches apart to give six levels of plant density ranging from 5·3 to 106 plants/yard of row. Each plot was split for spraying with demeton methyl at 6 fluid oz. of active ingredient per acre for aphid control, versus unsprayed. The results are given in Table 1.

The aphid counts have not yet been analysed, but it is evident that initial infestation and subsequent build-up was greatest, both on individual plants and per unit area of plot, where there was a thin plant stand. There were few aphids in plots with 57 and 106 plants per yard of row, and this is reflected in the yield, which did not benefit from the spray. As the plant population fell yield increases from spraying rose. (Way and Doherty.)

Natural control in relation to chemical control. This work was continued in collaboration with C. J. Banks of the Entomology Department. *A. fabae* laid many eggs in the autumn on some of the *Euonymus europaeus* bushes selected for study. Some hatched in February 1958, but did not survive the long cold period in March. Overwintering adults of Coccinellid and Anthocorid predators were abundant in April and May. The Coccinellids were probably plentiful because the big populations of many aphid species in May–July 1957 provided a good food supply. The predators helped to reduce the *A. fabae* populations on the winter host and also destroyed many young colonies developing later on the summer hosts—field beans, *Vicia faba* and fat hen, *Chenopodium album*—on which counts were made periodically.

Revised sampling methods, whereby plants were examined in detail in the laboratory, showed that Syrphid larvae preying on the aphids were abundant in July on summer hosts. These new sampling methods also showed that some of the previous methods were inadequate for the examination of numbers of larval predators.

Unsuitable weather and natural enemies kept *A. fabae* populations lower from May to July than might have been expected from the many overwintering eggs on some *E. europaeus* bushes. Small populations remained on the summer hosts (field beans, sugar beet and fat hen) from August to October, from which migrants returned to *E. europaeus*, where

TABLE 1

Plants per yard row....	5·3	11·3	20·7	41·4	57·0	106·0
Yield (cwt./acre):						
Untreated.....	16·6	24·2	27·9	27·9	26·2	20·5
Treated.....	24·1	31·2	32·3	29·8	25·1	21·3

large numbers developed in some bushes in October and November. (Way.)

Seed treatment with insecticides. Seed treatment with insecticides is a convenient and effective method of controlling some insect pests, and work was done on methods of formulating and applying insecticides to seeds and on their mode of action. One of the limitations of seed dressing is that relatively small amounts of active material will adhere to the seed unless special formulations are used, and various methods of applying liquid and solid insecticides were examined, using wheat and white mustard as test seeds. The stickers and fillers tested included aqueous emulsions of polyvinyl acetate and polystyrene, aqueous solutions of polyvinyl alcohol and methyl cellulose, polyethylene glycol, a siliceous earth, activated carbon and various proprietary insecticide fillers. Materials used in the formulation can affect the toxicity of the active ingredient, both to the insect and to the plant. Under some conditions both activated carbon and polyvinyl acetate depress the insecticidal activity of "Thimet", γ-BHC and dieldrin, and decrease the phytoxic effects of "Thimet" and γ-BHC. This may have considerable practical implications, because carbon is being used increasingly as a carrier for liquid organo-phosphorus insecticides. The possibility that the length of time the seed-dressing remains effective may be prolonged by means of materials in the formulation is being investigated.

Results this year confirmed that seed-dressings are more toxic to plants and insects in sand than in soil. (Bardner.)

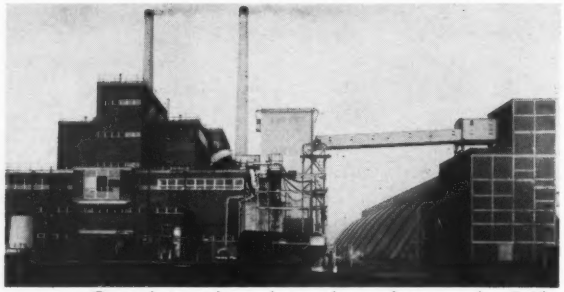
Further laboratory and field trials on the mode of action of dieldrin and γ-BHC when used as a seed-dressing against the wheat-bulb fly *Leptohylemyia coarctata* Fall. showed that kill by dieldrin, probably by contact action only, occurred when treated seed was shallowly sown, i.e., less than 1 inch from the soil surface. These results fall into line with those in which it was shown that most larvae come close to the soil surface before searching for and attacking a host plant, irrespective of the position of the egg from which they hatch. Deep sowing not only reduced kill by contact action of dieldrin outside the plant but also greatly reduced kill by systemic action after the larvae had entered the plant. Thus in one field trial using wheat dressed with 0·058 mg. dieldrin per seed, the percentage kills of larvae which entered the plant was 64 for sowings ½ inch deep and 0 for sowings 3 inches deep.

Preliminary experiments on the action of seed-dressings for the control of the onion fly *Delia antiqua* Meig. showed that dieldrin could prevent damage, probably because it killed the larvae by contact before they attacked the host plant. The choice of the underside of the bulb as the site of entry, even when the seed is sown 1 inch deep, ensures that the larva passes close to the treated seed. The evidence obtained indicated that the larvae were not killed by systemic action after entry in the plant.

Experiments with dieldrin seed-dressing on oat and wheat seed for the control of frit fly *Oscinella frit* L. showed that some larvae, probably those hatching from eggs in the soil, were killed by contact action outside the plant when the seed was shallow sown, but there was little or no effect when the seed was sown 1 or more inches deep. There was no evidence of systemic action, and thus, in practice, a dieldrin seed-dressing is not likely to be of value in Frit fly control.

The difference in the effectiveness of dieldrin seed-dressings for the control of these three pests may depend on differences in the environmental conditions when the attack occurs and differences in larval behaviour, as well as differences in absolute resistance of the larvae. Wheat-bulb-fly larvae may be poisoned on the way to the plant, and if not they go down to the growing point soon after entry, where there is likely to be a lethal concentration of poison in the tissues. Onion fly enters via the base of the bulb, and thus is likely to go through a zone of poison before entry. Apparently the conditions of growth are such that a lethal concentration of poison is not built up in the tissues of the onion. The frit-fly larva may enter the plant either above or below ground and does not necessarily pass through a zone of poison before entering the plant. Once in the plant, it may feed and not descend to the growing point for some time, and it is not therefore liable to be killed within the plant, even when the conditions of growth at the time of the year allow the presence of a lethal concentration in the tissues at the base of the plant. (Way.)

Imperial Chemical Expands



General view of granulation plant and storage silo. © ICI.

British manufacturer adds facilities for concentrated complete fertilizer

By J. GRINDROD

RECENTLY placed in production at the large Billingham complex of works of Imperial Chemical Industries Ltd. in Britain has been a new CCF (concentrated complete fertilizer) plant, which is claimed to be the largest granular fertilizer plant in Great Britain and one of the largest of its kind in the world.

In the new plant the solid raw materials—imported muriate of potash and Billingham sulfate of ammonia—are crushed, weighed and conveyed to a blunger for mixing with monoammonium phosphate liquor which is brought by special road tankers from the company's phosphate reaction plant. Granulation begins in the blunger and is completed in a large rotary drier. Thence the dried granules are screened, cooled and conveyed to a silo.

For convenience of operation the plant is divided into two identical systems, the equipment being symmetrically arranged in the plant layout.

At the phosphate reaction plant North African phosphate rock is ground to a fine powder and anhydrite from the company's mine 800 ft. below the Billingham works is roasted and converted into sulfuric acid. The acid and rock are then reacted to give phosphoric acid and gypsum which are separated by filtration. By evaporation, monoammonium phosphate liquor is concentrated before mixing.

The manufacture of monoammonium phosphate at Billingham early in 1930 made possible the production of the first granular CCF later that year. Different compound fertilizers were added to the selling range and the plant was extended in 1933. During the war, when production reached record levels, the range of CCFs was limited in the interests of higher output, and from 1946 only one was made. This contained 12 per cent N, 12 per cent P_2O_5, and 15 per cent K_2O, until 1956, when the potash content was increased to 18 per cent.

CCF is packed and shipped by road and rail from a new packing shed. The product can be conveyed either direct from the plant to the packing shed or via an air conditioned silo from which the product is packed as required.

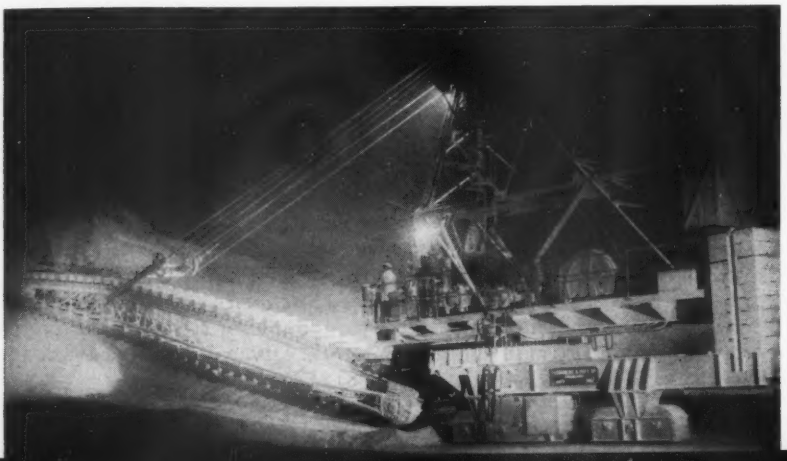
The Billingham Works of I.C.I. is the largest chemical factory in the British Commonwealth and, occupying a 1,100 acre site, has 90 miles of railway line and nine miles of paved road. More than 18,000 people work at the factories which make more than 90 different products whose total output approaches 2½ million tons a year. The works operate night and day and use nearly 5,000 tons of coal every 24 hours, 3,000 tons of it in its own power station.

Ammonia, Billingham's key product, plays a vital role in the works' 1,000,000 tons-a-year fertilizer production. Sulfuric acid is made by a process in which 1,000,000 tons-a-year of anhydrite are roasted with coke, sand and boiler ash in rotary kilns, the resultant gases being converted into acid.

Fertilizer production accounts for nearly one-half the total output of the Billingham works. With only two exceptions (phosphate rock and potash), all the principal raw materials are obtained locally. In addition to CCF, other fertilizers produced at Billingham are sulfate of ammonia, "Nitro-Chalk" Fifteen-five, "Kaynitro" (a new nitrogen-potash fertilizer) and urea. ▲

One of two rotary driers in the new plant

Interior of the storage silo in the CCF granulation plant



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EDITORIAL

FC

Our tips for small business will work for co-ops, too

You might want to ponder a letter we received last month from Burl B. Wyckoff, manager of the Fertilizer & Farm Chemical Department of the Washington Co-Operative Farmers Association, Seattle. (See *Letters*, page 7.) He's concerned about the series of articles we've been running since June about independent pesticide and fertilizer companies in the Great Northwest.

He thinks he's "entitled to a *rebuttal.*" This, of course, bothered us because we thought we had a fairly good idea of Webster's definition of the word:

"*Rebuttal:* the giving of evidence in a suit to destroy the effect of evidence introduced by the other side in the same suit."

Close scrutiny of the "low voltage" articles under discussion thus makes us wonder why a rebuttal is necessary when there's no one on trial!

FARM CHEMICALS has never come out for or against any particular *type* of marketing organization—but rather for "good, orderly marketing that assures a profit for the organization."

There are many reasons for the publication of "success stories" such as we've been running recently—aside from the fact that we like to consider this magazine as a champion of the free, competitive enterprise system—where individuals and groups are rewarded for their unusual foresight, ingenuity and efficiency.

One good reason for the series is that in the State of Washington and other marketing areas, there are a number of relatively small operators who are successfully competing with larger marketing organizations on the basis of the *technical service* they offer. Fellows like Tony Romano and Dick South, featured in June and July respectively.

We felt that readers of FARM CHEMICALS *would* profit *from some of the ideas these men have employed in their operations.*

Another reason for our interest was the *geographical* factor in the northwest. Agriculture there is spotty. The man who is *qualified* (posesses a good agronomic background, plus good business sense and is "willing to work like a fool") can build a good business on the basis of the genuine guidance he can offer farmers.

Because of this geographical factor mentioned, there is a *need* on the part of the farm chemicals industry to *look ahead with the farmer and help steer him toward planning . . . to help him face the many "make or break" decisions with which he must deal every day.*

As prima facie proof of the accuracy of the articles under discussion, we note that Wyckoff does *not* attack the articles. Our author, Homer Hathaway, carefully reported several *differences* between the independent and the co-op selling approaches—nothing else! We're proud of his objective reporting.

Although we fail to understand *Wyckoff's* apparent fears, we think that the USDA's most recent Statistics of Farmer Cooperatives (1957–59), published in June, should strike some fear in the hearts of *independents.* Latest count shows 4,143 coops handling fertilizer in 1956–57 with a gross value of almost $434 million. This was an increase of 3.7 per cent over the gross volume of $418.6 million in 1955–56.

After adjusting for duplication arising from business done *between coops*, this still leaves a net volume amounting to almost $275 million—or 63.3 per cent of the total gross value.

Now for pesticides. A total of 2,334 coops handled sprays and dusts in 1956–57, with a gross value of $57.2 million compared to $50.1 million in 1955–56.

Net value, after adjusting for duplication arising from business done between coops in 1956–57, amounted to $40.7 million—or 71.2 per cent of the total value.

In our June issue, we published an article, entitled "Phosphoria Gulch," concerning the huge operations of Central Farmers Fertilizer Company near Montpelier, Idaho. We reported that "this represents a major step of farm cooperatives into phosphate fertilizer processing in competition with chemical companies." To date we have yet to receive a single letter of "complaint" from independent competitors in that area.

We think there's plenty of room for all types of marketing organizations in this rapidly expanding agricultural economy—if they're wide awake and *efficient.* It's obvious that cooperatives and independents are waging unremitting, but friendly warfare in the Northwest, from whence comes such interesting reading for FARM CHEMICALS readers!

As for Wyckoff's request for a "rebuttal," we've already consulted with our Northwest author to look into the Washington Cooperative Farmers Association for any unusual marketing operations that make good reading!

GORDON L. BERG

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